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VOLUME NO. 2
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EXPLANATORY NOTES

OF

INCREASES, DECREASES, AND CHANGES IN LANGUAGE

IN THE BUDGET FOR THE

DEPARTMENT OF AGRICULTURE

FOR THE

FISCAL YEAR ENDING JUNE 30, 1933

AND OF

WORK DONE UNDER EACH OF THE APPROPRIATION ITEMS

CONFIDENTIAL UNTIL THE 1933 BUDGET
IS SUBMITTED TO CONGRESS)

(SEE VOLUME 1 FOR INDEX
AND FINANCIAL STATEMENT)

BUREAU OF PLANT INDUSTRY:

(a) GENERAL ADMINISTRATIVE EXPENSES

Funds Available, 1932:
Agricultural Act $210,266
Budget Estimate, 1933..... 210,266

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
General Administrative.....	$209,087	$210,266	$210,266	- - - - -

Savings for 1932 estimated $100 but no reduction in appropriation since fixed charges are such that similar savings cannot be definitely anticipated for 1933.

WORK UNDER THIS APPROPRIATION

The direction of the research, service and regulatory work of the Bureau of Plant Industry, the administration of its fiscal affairs, the general supervision of personnel, the administrative review and preparation of its research and other publications and bibliographical and related library work, as well as the partial financing of such service activities as the photographic laboratory, are carried on under this appropriation.

(b) ARLINGTON FARM

Funds Available, 1932:
Agricultural Act.....$60,600
Budget Estimate, 1933..... 60,600

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Arlington Farm.....	$75,726	$60,600	$60,600	- - - - -

Savings for 1932 estimated $100 but no reduction in appropriation since similar savings cannot be anticipated for 1933.

WORK UNDER THIS APPROPRIATION

A highly improved 400-acre tract is maintained in Virginia, near Washington, D. C., provided with laboratories, greenhouses, barns, shops, and other buildings, furnishing facilities for conducting experiments and practical farm tests covering a wide range of research work principally for the Bureau of Plant Industry, but also for Bureaus of Chemistry and Soils, Public Roads, and other branches.

(c) BARBERRY ERADICATION

Funds Available, 1932:	
Agricultural Act.....	$377,140
Budget Estimate, 1933.....	200,000
Decrease	177,140

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Barberry Eradication.....	$361,992	$377,140	$200,000	- $177,140 (1)

(1) Apparent decrease, $177,140; actual decrease in anticipated expenditures, $100,000, as it is contemplated that savings of $77,140 will be effected under this appropriation during 1932. During 1933 attention will be concentrated in the areas considered to be most likely to suffer from rust epidemics.

WORK UNDER THIS APPROPRIATION

The north-central wheat producing States, Colorado, Illinois, Indiana, Iowa, Michigan, Minnesota, Montana, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin, and Wyoming, are cooperating with the Bureau to eradicate the common barberry, an intermediate host of the wheat stem rust, as a means of controlling epidemics of black stem rust of wheat and other small grains.

Since 1918 more than 18,300,000 rust-susceptible barberry bushes have been destroyed in these States; of this number 168,784 were destroyed in 1930. During the five-year period 1916 to 1920, the average annual loss to wheat from stem rust, aside from its effect on quality, was estimated at 57,000,000 bushels, while for the five-year period 1926 to 1930, after millions of barberry bushes had been destroyed, the average annual loss attributed to this disease was estimated at less than 10,000,000 bushels.

(d) BLISTER RUST CONTROL

Funds Available, 1932:		
1. Agricultural Act.....	$456,000	
2. 2nd Def. Act, 1931 (Allotment 1932 from $50,000 for Western Control Work.....	45,000	
Total Appropriation, 1932		$501,000
Budget Estimate, 1933.....		469,997
Decrease		31,003*

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Eastern Control Program....	$205,985	$216,985	$212,108	- $ 4,877 (1)
Western Control Program....	249,570	284,015	257,889	- 26,126 (2)
	455,555	501,000	469,997	- 31,003*

*Apparent decrease, $31,003; actual decrease in anticipated expenditures, $12,203, as it is contemplated that savings of $18,800 will be effected under this appropriation during 1932 as a part of the general program for reduction of expenditures.

The decrease of $31,003 in appropriations is explained as follows:

(1) "Eastern Control Program":

Savings due to operating economies (1932 and continued in 1933).....	$2,200
Additional reduction, 1933.....	2,677
	4,877

(2) "Western Control Program":

Savings due to operating economies (1932 and continued in 1933).....	$16,600
Additional reduction, 1933.....	9,526
	26,126

Eastern Control Program. The work under this project consists of cooperation in blister rust control with the States of Connecticut, Maine, Massachusetts, Michigan, Minnesota, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Wisconsin, and with the Forest Service and National Park Service in these States.

Western Control Program. The work under this project consists of cooperation in blister rust control with the States of California, Idaho, Montana, Oregon and Washington, as well as with the Forest Service in the areas of the National forests and with the National Park Service in the park areas.

WORK UNDER THIS APPROPRIATION

Campaigns are conducted for the suppression and control of white pine blister rust by cooperating with State organizations, counties, towns, and individual landowners in the eradication of Ribes (currants and gooseberries) which serve as carriers of the disease, as well as in the application of measures to delay the spread of the disease to uninfected regions and through experimentation and investigation to develop better control measures.

(e) BOTANY

Funds Available, 1932:	
Agricultural Act.....	$56,260
Budget Estimate, 1933.....	52,260
Decrease.....	4,000*

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrese
Economic Botany.....	$24,447	$26,207	$22,607	- $ 3,600 (1)
Weed Investigations.....	7,165	7,240	7,240	- - -
Blueberry Investigations...	6,496	8,173	7,773	- 400 (2)
Grass Investigations.....	15,600	14,640	14,640	- - -
	53,708	56,260	52,260	- 4,000*

* Apparent decrease, $4,000; actual decrease in anticipated expenditures, $3,900, as it is contemplated that savings of $100 will be effected under this appropriation during 1932 as a part of the general program for reduction of expenditures.

The decrease of $4,000 in appropriations is explained as follows:

(1) "Economic Botany":

Savings due to operating economies (1932 and continued in 1933)	$ 100
Additional reduction, 1933	3,500
	3,600

(2) "Blueberry Investigations":

Reduction 1933, to be met by miscellaneous operating economies	$ 400

WORK UNDER THIS APPROPRIATION

The work consists of identification of cultivated plants, as well as wild plants, investigations of troublesome weeds through field studies, and the domestication and improvement of the blueberry.

Economic Botany. Work under this project includes identification of wild and cultivated plants for various institutions and individuals, maintenance of an economic herbarium and maintenance of a card catalogue of plants in American nursery trade.

Weed Investigations. Work under this project consists of small-scale field studies of certain troublesome weeds such as foxtail barley, blueweed sunflower, wild garlic, locoweed and perennial peppergrass with a view to developing methods of controlling these weeds.

Blueberry investigations. Work under this project consists of blueberry breeding and propagation experiments, which have resulted in the development of a blueberry industry in New Jersey, and these experiments are being extended to the Coastal Plain region from Florida to North Carolina.

Grass investigations. Work under this project consists of systematic investigations and identification of specimens of grasses, including the preparation of a manual of North American grasses.

(f) CEREAL CROPS AND DISEASES

Funds Available, 1932:		
Agricultural Act	$574,060	
Budget Estimate, 1933	554,485	
Decrease		$19,575*

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Cereal Production and Improvement	$349,389	$351,340	$339,915	- $11,425 (1)
Cereal Diseases	206,603	222,720	214,570	- 8,150 (2)
	555,992	574,060	554,485	- 19,575*

* Apparent decrease, $19,575; actual decrease in anticipated expenditures, $2,875, as it is contemplated that savings of $16,700 will be effected under this appropriation during 1932 as a part of the general program for reduction of expenditures.

The decrease of $19,575 in appropriation is explained as follows:

(1) "Cereal Production and Improvement":

Savings due to operating economies (1932 and continued in 1933)	$8,000
Savings in construction, Arlington Farm, Va. (1932 and continued in 1933)	1,500
Additonal reduction 1933, account of travel economies	1,725
	11,425

(2) "Cereal Diseases":

Savings due to operating economies (1932 and continued in 1933)	$5,500
Savings in construction, Arlington Farm, Va. (1932 and continued in 1933)	1,500
Additional reduction 1933, account of travel economies	1,150
	8,150

WORK UNDER THIS APPROPRIATION

The work includes studies of cultural practices with cereal crops and investigation of their possible improvement, comparison of yield and adaptability to different regions of different varieties of cereals, together with the breeding and selection of improved and better adapted

varieties, and development of methods of control of the diseases of all cereal crops. Cooperative experiments are carried on at most of the State Agricultural Experiment Stations, but no independent field stations are maintained.

Cereal production and improvement. Under this project cooperative experiments are carried on at most of the State Agricultural Experiment Stations in the development of new varieties of cereals of superior yield and quality and resistant to drought, cold, insect pests, and diseases, as well as adapted to particular regions, in the determination of cultural and fertilizer requirements of cereals, including wheat, corn, oats, barley, rice, grain sorghums, etc.

Allotments to investigations on these crops for 1932 are as follows:

Wheat	$131,905	Grain sorghums and Broomcorn	$17,745
Oats	34,070	Seed Flax	17,200
Barley	30,675	Corn	79,365
Rice	40,380		

Cereal diseases. Work under this project consists of investigations leading to methods of control of foot rots of wheat, wheat and barley scab, corn root, stalk, and ear rots, stinking smut of wheat, wheat rusts, flax wilt, and other diseases of small grains and flax now causing serious loss each year in the growing of these crops.

Allotments to cereal disease studies for 1932 are as follows:

Virus diseases	$19,395	Rust investigations	$55,580
Bacterial diseases	11,565	Smut investigations	34,875
Sac and Imperfect fungi	91,640	Pathological physiology investigations	9,665

(g) CITRUS CANKER ERADICATION

Funds Available, 1932:	
Agricultural Act	$40,000
Budget Estimate, 1933	32,100
Decrease	7,900

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Citrus Canker Eradication	$43,084	$40,000	$32,100	- $7,900 (1)

(1) Apparent decrease, $7,900; actual decrease in anticipated expenditures, $5,000, as it is contemplated that savings of $2,900 will be effected under this appropriation during 1932 as a part of the general program for reduction of expenditures.

WORK UNDER THIS APPROPRIATION

In cooperation with Florida, Alabama, Mississippi, Louisiana and Texas, the Bureau conducts a campaign for the eradication of citrus canker, a bacterial disease of citrus fruits and trees, by the thorough inspection of nurseries and citrus groves, formalin treatment of infected soil, protective spraying of groves exposed to infection, and destruction of diseased trees. As a result of the vigorous campaign, the disease has been practically eliminated from the commercially important areas, but scattered infections still occur sporadically.

Each State is now maintaining a close reinspection of all citrus properties and this will be continued for several years because of the extreme infectiousness of the disease. No infections have been found in Florida, Alabama or Mississippi for several years but scattered infections in dooryard plantings outside of commercial districts have been found in Texas and Louisiana.

(h) COTTON PRODUCTION AND DISEASES

Funds Available, 1932:	
Agricultural Act	$233,140
Budget Estimate, 1933	221,040
Decrease	12,100*

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Acclimatization, Breeding and Cultural Improvement of Cotton.....	$134,414	$150,636	$144,586	- $ 6,050 (1)
Egyptian Cotton Breeding	24,237	24,800	24,800	- - -
Cotton Diseases.....	44,656	57,704	51,654	- 6,050 (2)
	203,307	233,140	221,040	- 12,100*

* Apparent decrease, $12,100; actual decrease in anticipated expenditures, $2,700, as it is contemplated that savings of $9,400 will be effected under this appropriation during 1932 as a part of the general program for reduction of expenditures.

The decrease of $12,100 in appropriations is explained as follows:

(1) "Acclimatization, breeding and cultural improvement of Cotton":

Savings due to operating economies and curtailing of field work (1932 and continued in 1933)	$4,700
Additional reduction, 1933	1,350
	6,050

(2) "Cotton Diseases":

Savings due to operating economies and to curtailing of field work (1932 and continued in 1933)	$4,700
Additional reduction, 1933	1,350
	6,050

WORK UNDER THIS APPROPRIATION

Investigations consist chiefly of research toward acclimatization of tropical varieties of cotton, breeding superior varieties of cotton, improved cultural practices, and investigation and control of diseases.

In addition to cooperative experiments at State agricultural experiment stations, field stations are maintained at the following points:

Sacaton, Arizona	James Island, South Carolina
Bard, California	Wadmalaw Island, South Carolina
San Diego, California	Greenville, Texas
Shafter, California	San Antonio, Texas
State College, New Mexico	

Acclimatization, breeding and cultural improvement of cotton. Work is carried on on the acclimatization and adaptation in the Southwestern United States of cotton introduced from tropical regions, the breeding of superior varieties of cotton, such as Sea Island cotton, the improvement in methods of cotton culture under boll-weevil conditions, and the development of one-variety communities and the establishment of supplies of pure seed.

Egyptian cotton breeding. Work on this project includes the selection and hybridization of strains of Egyptian cotton through the ordinary methods of plant breeding, testing promising strains on a field basis, and the making available to farmers of the variety which yields best and which produces fiber giving best results in spinning tests, in the areas now growing Pima and other new long-staple cottons.

Cotton diseases. Work under this project consists of research to develop methods of control of cotton diseases such as wilt, root rot and other disorders seriously affecting the profitable production of cotton. A special investigation of cotton root-rot is being carried on in cooperation with the Bureau of Chemistry and Soils and with the State Experiment Station of Texas.

(i) DRUG AND RELATED PLANTS

Funds Available, 1932:	
Agricultural Act	$58,120
Budget Estimate, 1933.....	38,120
Decrease	20,000

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Drug, Poisonous and Oil Plants.....	$36,522	$38,120	$38,120	- - -
Hop Diseases.....	4,100	20,000	- - -	- $20,000
	40,622	58,120	38,120	- 20,000 (1)

(1) Apparent decrease, $20,000; actual decrease in anticipated expenditures, $17,200, as it is contemplated that savings of $2,800 will be effected under this appropriation during 1932 as a part of the general program for reduction of expenditures. The reduction for 1933 will be met by discontinuation of the hop disease project.

WORK UNDER THIS APPROPRIATION

Scientific studies are made on the growing of drug, essential oil, oilseed and related crops, and on the distribution and economic importance of plants poisonous to livestock. Cooperative experiments are located at the Oregon Agricultural Experiment Station.

Drug, Oil and Poisonous Plants. Work under this project consists of investigations of the growing of drug, essential oil, oilseed and related crops and on the preparation of commercial products therefrom to determine the possibility of growing these plants as farm crops; also investigations of the distribution of plants poisonous to livestock and of the toxic constituents of such plants.

Hop Diseases. An investigation has been inaugurated of the downy mildew of hops which during the past two years has caused considerable alarm among hop growers of the Northwest; experimental spraying of infected fields under varying conditions and dusting of crowns is under way to develop eradication and control practices and reduce losses to the growers.

(j) DRY-LAND AGRICULTURE

Funds Available, 1932:		
Agricultural Act	$345,740	
Less amount transferred to Horticultural Crops and Diseases (Cheyenne Station)	80,000	
Net Total, 1932		$265,740
Budget Estimate, 1933		245,960
Decrease		19,780

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Dry-Land Crop Production	$187,123	$189,000	$169,220	- $19,780
Dry-Land Fruit and Vegetable Production	26,226	26,860	26,860	- - -
Cooperative Shelter-belt Demonstrations and Experimental Test Plantings	49,829	49,880	49,880	- - -
	263,178	265,740	245,960	- 19,780 (1)

(1) Apparent decrease, $19,780; actual decrease in anticipated expenditures, $10,170, as it is contemplated that savings of $9,610 will be effected under this appropriation during 1932 as a part of the general program for reduction of expenditures. The reduction of $19,780 for 1933 will be met by discontinuance of the Ardmore, South Dakota Field Station.

CHANGE IN LANGUAGE

The elimination of the following language is recommended:

> "Provided, That $80,000, including construction of physical improvements, shall be available for the horticultural experiment station at Cheyenne, Wyoming: Provided further, That $35,000 shall be available for carrying into effect the Act approved April 16, 1928 (U. S. C., Supp. III, title 7, secs. 387-388a) entitled 'An Act providing for horticultural experiment and demonstration work in the Southern Great Plains area', at Woodward, Oklahoma".

As the language of the proviso regarding the station at Cheyenne, Wyoming, indicates, this is a horticultural experiment station. In the development of a new station of this size and character it has been found more satisfactory to operate under the direction of the staff of the Division of Horticultural Crops and Diseases. Accordingly it is desirable to eliminate this language from the item for Dry-Land Agriculture and to transfer the funds ($80,000) to the appropriation for Horticultural Crops and Diseases.

With reference to the omission of the proviso regarding the station at Woodward, Oklahoma, the Act establishing the station is within the general outline of the authority of the Bureau, and therefore continued reference to the Act establishing the station is not needed. No modification in plan of activities at Woodward is contemplated.

WORK UNDER THIS APPROPRIATION

The problems of agricultural and horticultural development of the Great Plains area, a region classed as semi-arid, are studied at field stations to obtain the fullest possible information concerning soil and climatic conditions throughout the region and the agricultural effectiveness of each of the many different methods of tillage and crop rotations that can be considered as more or less suitable for this region where irrigation is not available.

Field stations are maintained at the following points:

	Allotment 1932		Allotment 1932
Akron, Colorado.....	$10,900	Ardmore, South Dakota ..	$19,780
Tucumcari, N.M.	9,300	Big Spring, Texas.....	9,075
Mandan, N.D.	48,700	Dalhart, Texas.....	9,300
Lawton, Oklahoma.....	10,000	Sheridan, Wyoming.....	10,040
Woodward, Oklahoma...	48,450		

Dry-land crop production. The work under this project consists of rotation and tillage experiments with cereal crops, forage crops and cotton, as well as pasture conservation and development in this region.

Dry-land fruit and vegetable production. The work under this project consists of demonstrations of the feasibility of growing in this semi-arid region certain fruits and vegetables which can be produced on a home-garden scale.

Cooperative shelter-belt demonstrations and experimental test plantings. Under this project trees and ornamental plants than can be grown in dry regions are propagated and placed with experimenters for testing and demonstrations of trees planted as shelter belts are are developed and encouraged.

(k) FORAGE CROPS AND DISEASES

Funds Available, 1932:	
Agricultural Act	$279,375
Budget Estimate, 1933	265,205
Decrease	14,170*

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Alfalfa.....	$72,098	$72,828	$69,144	- $ 3,684 (1)
Red and Sweet Clover.....	36,955	37,261	35,419	- 1,842 (2)
Soybeans.....	30,472	30,199	28,640	- 1,559 (3)
Sorghums	9,342	9,224	8,799	- 425 (4)
Winter Legumes, Green Manures and Acid Tolerant Legumes	40,994	44,292	42,025	- 2,267 (5)
Pastures, Grasses and Fine Turf	85,610	85,571	81,178	- 4,393 (6)
	275,471	279,375	265,205	- 14,170*

* Apparent decrease, $14,170; actual decrease in anticipated expenditures, $2,770, as it is contemplated that savings of $11,400 will be effected under this appropriation during 1932 as a part of the general program for reduction of expenditures.

The decrease of $14,170 in appropriations is explained as follows:

(1) "Alfalfa":

Savings due to operating economies (1932 and continued in 1933)	$2,964
Additional reduction, 1933.....	720
	3,684

(2) "Red and Sweet Clover":

Savings due to operating economies (1932 and continued in 1933)	$1,482
Additional reduction, 1933	360
	1,842

(3) "Soybeans":

Savings due to operating economies (1932 and continued in 1933)	$1,254
Additional reduction, 1933	305
	1,559

(4) "Sorghums":

Savings due to operating economies (1932 and continued in 1933)	$ 342
Additional reduction, 1933	83
	425

(5) "Winter Legumes, Green Manures and Acid Tolerant Legumes":

Savings due to operating economies (1932 and continued in 1933)	$1,824
Additional reduction, 1933	443
	2,267

(6) "Pastures, Grasses and Fine Turf":

Savings due to operating economies (1932 and continued in 1933)	$3,534
Additional reduction, 1933	859
	4,393

WORK UNDER THIS APPROPRIATION

Field studies are conducted throughout the United States and cooperative relations are maintained with nearly all of the State experiment stations, and insular experiment stations, pertaining to the production, improvement and control of diseases of all crop plants used for forage either as hay, fodder, silage, or pasture, and incidentally of all plants used for green manuring, turf production and soil binding.

Cooperative experiments are conducted at State agricultural experiment stations, but no independent field stations are maintained.

Alfalfa. Under this project are conducted investigations of alfalfa improvement through breeding and selection of superior varieties, development of improved cultural methods, and studies of alfalfa wilt and methods of testing resistance to this disease.

Red and sweet clover. The work under this project consists of research and experiments on breeding superior varieties, improvement of cultural methods, and studies leading to control of mildew and other clover diseases.

Soybeans. The work under this project consists of introduction of new varieties of soybeans, determination of the oil and protein content of various varieties, selection of better forage and grain varieties for certain localities and varieties resistant to nematodes, root rot, etc.

Sorghums. The work under this project consists of investigations concerning the use of sorghum for forage including the introduction and development by selection and breeding of new varieties, genetic studies and the determination of effective cultural methods for these important feed crops in the semi-arid regions.

Winter legumes, green manures, and acid-tolerant legumes. Under this project the growing of winter legumes and green manures are encouraged for soil improvement, and new legumes such as Crotalaria are introduced and propagated, with a view to securing satisfactory succeeding crops on sandy, acid and other difficult soils.

Pasture, grasses and fine turf. Under this project investigations are in progress to determine the best methods of establishing and maintaining good pastures. New grasses for pastures and for golf turfs are introduced and tested, fertilizer needs are determined and methods of controlling turf diseases and insects are developed.

(1) FOREIGN PLANT INTRODUCTION

Funds Available, 1932:	
Agricultural Act	$228,140
Budget Estimate, 1933	204,925
Decrease.....	23,215*

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Foreign Explorations.....	$51,332	$34,060	$19,435	- $14,625 (1)
Experimenters' Service....	180,692	185,852	177,262	- 8,590 (2)
Plant Geography.....	8,228	8,228	8,228	- - -
	240,252	228,140	204,925	- 23,215*

* Apparent decrease, $23,215; actual decrease in anticipated expenditures, $15,815, as it is contemplated that savings of $7,400 will be effected under this appropriation during 1932 as a part of the general program for reduction of expenditures.

The decrease of $23,215 in appropriations is explained as follows:

(1) "Foreign Explorations":

Reduction in 1933 to be met by operating economies and curtailment of travel in foreign countries in connection with the explorations for disease-resistant potato types.....$14,625

(2) "Experimenters' Service":

Savings due to operating economies (1932 and continued in 1933)	$7,400
Additional reduction, 1933	1,190
	8,590

WORK UNDER THIS APPROPRIATION

Plant material is imported from foreign countries and tested with a view to establishing new plant industries in the United States. Field stations are maintained at the following points:

Chico, California	Savannah, Georgia
Coconut Grove, Florida	Glenn Dale, Maryland

Foreign explorations. Special foreign explorations are conducted under this project from time to time to secure new and promising types of plants superior to those now grown in this country and having promise of aiding in the development of new crop industries through breeding, development of disease resistance, and meeting changed and shifting economic needs.

Experimenters' service. By means of a system of cooperative contacts maintained with institutions and individuals in all parts of the world, plant material is imported and tested at the stations of the Department, by State and other institutions, and by individual cooperators, with a view to determining their adaptability in this country before extensive cultivation is advised.

Plant geography. Under this project investigations are carried on of the relation of crop distribution to climatic and soil conditions, and studies are made of the important problems in plant production from a geographical point of view, with a view to locating foreign sources of potentially valuable crops and to insure that plantings of such crops, if introduced, are provided with soil and climatic conditions suited to their needs.

(m) FOREST PATHOLOGY

Funds Available, 1932:		
1. Agricultural Act	$223,572	
2. 2nd Def. Act, 1931-32 (Allotment $13,332 for Dutch Elm Diseases).....	13,332	
Total Appropriation, 1932		$236,904
Budget Estimate, 1933		223,136
Decrease		13,768*

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Tree Disease Emergencies...	$29,887	$43,702	$34,934	- $8,768 (1)
Diseases of Shade Trees, Shrubs and Chestnut Orchards	67,098	68,202	68,202	- - -
Diseases of Forest Trees and Forest Products.....	110,616	125,000	120,000	- 5,000 (2)
	207,601	236,904	223,136	- 13,768*

* Apparent decrease $13,768; actual decrease in anticipated expenditures $4,668, as it is contemplated that savings of $9,100 will be effected under this appropriation during 1932 as a part of the general program for the reduction of expenditures.

The decrease of $13,768 in appropriations is explained as follows:

(1) "Tree Disease Emergencies":

Savings due to operating economies (1932 and continued in 1933)	$5,787
Additional reduction, 1933, account of postponement in part of the Dutch Elm Disease survey.....	2,981
	8,768

(2) "Diseases of Forest Trees and Forest Products":

Operating savings (1932 and continued in 1933)	$3,313
Additional reduction, 1933, account postponement cooperative work with Forest Experiment Station at Asheville, N. C.	1,687
	5,000

CHANGE IN LANGUAGE

The change in the following language is recommended:

The change from $125,000 to $120,000 in the amount authorized for expenditure investigations under section 3 of the McNary-McSweeney Act is made pursuant to item (2) above.

WORK UNDER THIS APPROPRIATION

The diseases of forest and shade trees and shrubs, including white pine blister rust, chestnut blight, heart-rot of Douglas fir, European larch canker, and many other diseases, are investigated with a view to determining methods of control.

Tree disease emergencies. Work under this project consists of the investigation of the newly discovered Dutch elm disease in this country, a scouting program to determine occurrence of European larch canker, and investigations leading to its control, as well as preliminary studies of the Woodgate rust.

Diseases of shade trees, shrubs, and chestnut orchards. Work under this project consists of investigations leading to the control of the diseases of street and other ornamental trees and shrubs.

Diseases of forest trees and forest products. Work under this project located at the Experiment Stations of the Forest Service, consists of investigations of the native diseases attacking standing trees in the forest, as well as the discoloration and decays of logs, timbers, etc., and is part of the program under the McNary-McSweeney Act. Research on the chestnut blight disease as well as on the white pine blister rust, forming a basis for the controlling of these diseases, is included.

(n) GARDENS AND GROUNDS

Funds Available, 1932:	
Agricultural Act	$98,120
Budget Estimate, 1933	98,120

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Gardens and Grounds	$97,702	$98,120	$98,120	- - -

Savings for 1932 estimated $100 but no reduction in appropriation since similar savings cannot be anticipated for 1933.

WORK UNDER THIS APPROPRIATION

A range of thirty-two greenhouses is maintained, providing for experimental work with a wide range of plants; the propagation of plants for ornamenting the grounds of the Department, the lighting of the grounds and the removal of refuse from the buildings is provided for in this item.

In addition to the special greenhouse services provided, two general exhibitions are held annually. In the Chrysanthemum Show, November, 1931, 2,000 plants were exhibited. In the Amaryllis show, March 1931, 1,200 plants were exhibited, all hybrids originated in these greenhouses.

(o) GENETICS AND BIOPHYSICS

Funds Available, 1932:	
Agricultural Act	$36,420
Budget Estimate, 1933	36,420

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Genetics and Biophysics....	$35,968	$36,420	$36,420	- - -

Savings for 1932 estimated $100 but no reduction in appropriation since similar savings cannot be anticipated for 1933.

CHANGE IN LANGUAGE

The change of side title from "Biophysical laboratory" to "Genetics and biophysics" is made in order to more correctly describe this activity.

WORK UNDER THIS APPROPRIATION

Field and laboratory investigations are carried on upon the growth and reproduction of various crop plants with especial reference to the influence of physical conditions such as applying electric currents to stimulate growth and experiments with paper or other mulches affecting the composition of the soil atmosphere.

(p) HORTICULTURAL CROPS AND DISEASES

Funds Available, 1932:		
1. Agricultural Act	$1,420,360	
2. Plus amount transferred from Dry-Land Agriculture (Cheyenne Station)	80,000	
Total Funds, 1932		$1,500,360
Budget Estimate, 1933		1,447,660
Decrease		52,700*

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Deciduous Fruit Production Investigations	$ 181,916	$ 208,787	$ 200,274	$ - 8,513 (1)
Nut Production Investigations	118,162	140,973	134,940	- 6,033 (2)
Subtropical Fruit Production Investigations	----	18,000	17,259	- 741 (3)
Plant Propagation, Nursery Management and Stock Storage	33,837	33,576	33,336	- 240 (4)
Crop Physiology	109,437	107,727	102,133	- 5,594 (5)
Fruit Disease Investigations	192,309	219,555	211,684	- 7,871 (6)
Vegetable Production, Standardization and Improvement	141,090	143,588	137,808	- 5,775 (7)
Vegetable Disease Investigations	101,150	120,529	115,076	- 4,453 (8)
Potato Investigations	56,175	54,886	54,493	- 393 (9)
Fruit and Vegetable Handling, Transportation and Storage Investigations	206,399	234,322	225,061	- 9,266 (10)
Fruit and Vegetable Utilization Investigations	41,201	44,580	44,252	- 328 (11)
Floriculture and Landscape Gardening	14,647	14,746	14,637	- 109 (12)
Bulb Culture	24,784	23,187	23,023	- 164 (13)
Diseases of Ornamental Plants	33,055	33,278	31,956	- 1,322 (14)
Plant Physiological Laboratory	11,283	11,442	11,355	- 87 (15)
Pathological Laboratory	15,249	11,184	10,929	- 1,255 (16)
Cheyenne Horticultural Field Station (Transferred from "Dry Land Agriculture") ...	96,694	80,000	79,444	- 556 (17)
	1,377,338	1,500,360	1,447,660	-52,700 *

* Apparent decrease, $52,700; actual decrease in anticipated expenditures, $8,500, as it is contemplated that savings of $44,200 will be effected under this appropriation during 1932 as a part of the general program for reduction of expenditures.

The decrease of $52,700 in appropriations is explained as follows:

(1) "Deciduous Fruit Production Investigations":

Savings due to general operating economies (1932 and continued in 1933)	$ 7,023
Additional reduction, 1933;	1,490
	8,513

(2) "Nut Production Investigations":

Savings due to general operating economies (1932 and continued in 1933)	5,203
Additional reduction, 1933;	830
	6,033

(3) "Subtropical Fruit Production Investigations":

Savings due to general operating economies (1932 and continued in 1933)	596
Additional reduction, 1933;	145
	741

(4) "Plant Propagation, Nursery Management and Stock Storage":

Savings due to general operating economies (1932 and continued in 1933)	240

(5) "Crop Physiology":

Savings due to general operating economies (1932 and continued in 1933)	4,834
Additional reduction, 1933;	760
	5,594

(6) "Fruit Disease Investigations":

Savings due to general operating economies (1932 and continued in 1933)	6,591
Additional reduction, 1933;	1,280
	7,871

(7) "Vegetable Production, Standardization and Improvement":

Savings due to general operating economies (1932 and continued in 1933)	4,845
Additional reduction, 1933;	930
	5,775

(8) "Vegetable Disease Investigations":

Savings due to general operating economies (1932 and continued in 1933)	$ 580
Additional reduction, 1933	3,873
	4,453

(9) "Potato Investigations":

Savings due to general operating economies (1932 and continued in 1933)	393

(10) "Fruit and Vegetable Handling, Transportation and Storage Investigations":

Savings due to general operating economies (1932 and continued in 1933)	7,591
Additional reduction, 1933	1,675
	9,266

(11) "Fruit and Vegetable Utilization Investigations":

Savings due to general operating economies (1932 and continued in 1933)	328

(12) "Floriculture and Landscape Gardening":

Savings due to general operating economies (1932 and continued in 1933)	109

(13) "Bulb Culture":

Savings due to general operating economies (1932 and continued in 1933)	164

(14) "Diseases of Ornamental Plants":

Savings due to general operating economies (1932 and continued in 1933)	1,072
Additional reduction, 1933	250
	1,322

(15) "Plant Physiological Laboratory":

Savings due to general operating economies (1932 and continued in 1933)	87

(16) "Pathological Laboratory":

Savings due to general operating economies (1932 and continued in 1933)	$ 695
Additional reduction, 1933	560
	1,255

(17) "Cheyenne Horticultural Field Station":

Savings due to general operating economies (1932 and continued in 1933)	556
	52,700

CHANGE IN LANGUAGE

The provision that $15,000 shall be available toward the establishment of a pecan experiment station in Mississippi is omitted.

WORK UNDER THIS APPROPRIATION

Under this appropriation investigations are conducted to determine the best methods of culture, propagation, breeding, selection, disease control and related activities as affecting the most profitable production of fruits, nuts, vegetables, ornamentals, nursery stock and related plants. The interrelation of various orchard practices and problems concerned with the nutrition and physiology of the various horticultural plants are studied. Investigations for determining the best methods of harvesting, packing, shipping, storing and utilizing horticultural products are also conducted, including the physiological and related changes of perishables during marketing and storage.

In addition to cooperative activities with the State Agricultural Experiment Stations, Bureau of Indian Affairs of the Department of the Interior, and others, field stations and laboratories are maintained at the following points:

Chula Vista, California.
Fresno, California.
Indio, California.
Lamanda Park, California.
Los Angeles, California.
Oakville, California.
Riverside, California.
Sacramento, California.
Greeley, Colorado.
Eustis, Florida.
Orlando, Florida.
Albany, Georgia.
Fort Valley, Goergia.
Philema, Georgia.
Thomasville, Georgia.
Chicago, Illinois.
Vincennes, Indiana.
Robson, Louisiana.
Shreveport, Louisiana.
Presque Isle, Maine.
Bethesda, Maryland.
Toms River, New Jersey.
New York City, New York.
Chadbourn, North Carolina.
Hood River, Oregon.
Brownwood, Texas.
Bellingham, Washington.
Wenatchee, Washington.
Yakima, Washington.
Cheyenne, Wyoming.

Deciduous fruit production investigations. The type of growth associated with high production and the fertilizer treatment, water requirements and other cultural factors in growing tree fruits are under experimentation, as well as production studies on grapes and the small fruits such as strawberries, raspberries and blackberries. By hybridization and selection improved varieties of peaches, plums, apples, pears, apricots, grapes and berries are being developed. Selections of bud variations of deciduous fruit varieties are propagated to develop improved strains or varieties of these fruits.

Nut production investigations. This work includes experiments on culture and breeding of almonds and walnuts in California, of filberts and walnuts in the Pacific Northwest, of pecans in Texas, Louisiana, Georgia, and other Southern States and black walnuts, hickories, and filberts in the Central and Northeastern States.

Subtropical fruit production investigations. Cultural studies are conducted to determine those methods of pruning, fertilization, soil management and other practices which will result in greater yields of higher quality fruit. Citrus, figs, avocados and other subtropical fruits are included in these studies.

Plant propagation, nursery management and stock storage. This work consists of determining the best methods of propagating fruit trees and roses. Various stocks are studied to determine those best suited for the various fruits and ornamentals.

Crop physiology. The purpose of this work is to establish date culture on a satisfactory commercial basis in those regions of the United States where soil and climate are favorable and to develop by breeding varieties better suited than imported varieties. Breeding and stock experiments are carried on with citrus fruits and an attempt is made to develop stocks equal in quality to the standard varieties now grown commercially but possessing a greater degree of resistance to cold, disease and boron injury. Experimental plantings of Smyrna figs, pistaches and other special crops are made with a view to establishing their culture in this country.

Fruit disease investigations. Investigations are conducted on the fungous, virus and physiological diseases of fruits and fruit trees, including citrus and subtropical fruits, grapes, and small fruits, fruit rots and decays, and diseases of the pecan and other nuts, with a view of their control by spraying, disinfection, eradication and other methods.

Vegetable production, standardization and improvement. These investigations include improvement in cultural practices of vegetables, improvement by breeding of superior varieties, production on muck soils, and field tests for the purpose of establishing variety standards and variety descriptions.

Vegetable disease investigations. Investigations are conducted on the fungous and virus diseases of vegetables to determine their cause, conditions under which they develop, localities where they are most serious, methods of disease transmission and to develop control measures.

Potato investigations. Experimental work is carried on in different regions with a view to developing through breeding and selection more desirable commercial varieties and to improving cultural practices.

Fruit and vegetable handling, transportation and storage investigations. These studies include experiments to determine the best methods of handling, transportation and storage of fruits and vegetables, including the control of diseases in storage, during transit and on the market; the effect of ethylene and other gases in coloring fruits and vegetables; methods of removing spray residues and investigations on the frozen pack method of preservation.

Fruit and vegetable utilization investigations. These experiments include study of the fundamental factors involved in preservation of food by canning, the value of different varieties with respect to quality of the final product, and study of microbiological problems arising from frozen packing of berries and other fruits.

Floriculture and landscape gardening. Studies of adaptability for planting in various regions are made of different varieties of herbaceous and woody ornamental plants, including annuals, perennials, roses and chrysanthemums, together with arrangement of plants and trees for ornamental effect, including their use on farmsteads and roadsides.

Bulb culture. Experiments with tulips, hyacinths, narcissus and other bulbs are under way with a view to aiding the rapidly developing bulb-growing industry of the United States.

Diseases of ornamental plants. Investigations are conducted on the funguous, virus and physiological diseases of ornamental plants and floral crops to determine the best means of control.

Pathological laboratory. The problems dealt with involve laboratory, greenhouse, and field experiments with bacterial diseases of crop and ornamental plants, such as crown gall, perennial apple canker, and bacterial blight of beans and peas.

Plant physiological laboratory. The physiological processes in plants are investigated from the physical and biochemical standpoint to furnish fundamental knowledge for work in breeding, increasing production, disease and frost resistance, and in handling and storage methods.

Cheyenne Horticultural Field Station. Experiments under both dry-land and irrigated conditions are conducted with fruits, vegetables, flowers and shelter-belt plants. Fertilizer, pruning, soil management, thinning and pollination studies are conducted. Breeding investigations are conducted for the purpose of developing better varieties resistant to drought and cold. Extensive experiments in shelter-belt plantings are in progress.

(q) MYCOLOGY AND DISEASE SURVEY

Funds Available, 1932:	
Agricultural Act	$59,960
Budget Estimate, 1933	59,960

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Mycological Collections	$22,437	$22,728	$22,728	- - -
Epidemiology and Disease Survey	30,684	31,132	31,132	- - -
Mushroom Culture and Diseases	5,965	6,100	6,100	- - -
	59,086	59,960	59,960	- - -

Savings for 1932 estimated $100 but no reduction in appropriation since similar savings cannot be anticipated for 1933.

WORK UNDER THIS APPROPRIATION

In this division is maintained a collection of plant parasites and other fungi, surveys of plant diseases in the United States are carried on, and the investigations on the culture and diseases of mushrooms are conducted.

Mycological collections. Work under this project consists of maintenance of collections of specimens of plant parasites and other fungi having relation to injury or destruction of economic plants and plant products, their identification, and preservation for technical study and reference purposes.

Epidemiology and disease survey. Work under this project consists of surveys to determine the geographic distribution, prevalence, and rate of spread of plant diseases in the United States and losses caused by disease, as well as the appearance of new or dangerous diseases and epidemics or unusual outbreaks of disease.

Mushroom culture and diseases. Work under this project consists of investigation of mushroom growing and the control of the Mycogone disease and other diseases of mushrooms.

(r) NATIONAL ARBORETUM

Funds Available, 1932
Agricultural Act.....$30,000
Budget Estimate, 1933..... 5,000
Decrease..... 25,000

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
National Arboretum.....	$1,625	$30,000	$5,000	- $25,000(1)

(1) Apparent decrease $25,000 but no decrease in anticipated expenditures, since savings of $25,000 are anticipated in connection with this item during 1932 because of the postponement of the development of the arboretum. This postponement will be continued during 1933 and the $25,000 is dropped from the estimates.

WORK UNDER THIS APPROPRIATION

This item is for development of the arboretum established under the Act of March 4, 1927.

(s) NEMATOLOGY

Funds Available, 1932:
Agricultural Act.....$58,260
Budget Estimate, 1933.....$58,260

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
A study of the Nature, Distribution and Treatment of Diseases caused by certain nemas; studies concerning fiber and living cells.....	$50,365	$50,760	$50,760	---
A study of the Mermithidae, a large and important group of nemas infesting insects only.....	7,500	7,500	7,500	---
	57,865	58,260	58,260	---

Savings for 1932 estimated $100 but no reduction in appropriation since similar savings cannot be anticipated for 1933.

WORK UNDER THIS APPROPRIATION

These investigations deal primarily with the minute eelworms or nemas, certain species of which infest important crop plants and seriously injure them, whereas other species have been found to be beneficial, destroying insects or other species of injurious nemas.

Field laboratories are maintained at Salt Lake City, Utah, and at East Falls Church, Virginia.

A study of the nature, distribution and treatment of diseases caused by certain neams; studies concerning fibers and living cells. Under this project are worked out studies of the troublesome nematode disease of strawberries, known as dwarf or crimp, neamtode diseases of bulbs, sweet potatoes, etc.

A study of the nermithidae, a large and important group of nemas infesting insects mainly. These studies have resulted in the discovery that certain nemas infest troublesome insects such as the more destructive grasshoppers and cucumber beetle, and offer the possibility of their use in insect control.

(t) PHONY PEACH ERADICATION

Funds Available, 1932:	
Agricultural Act.....	$85,000
Budget Estimate, 1933.....	82,150
Decrease.....	2,850

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Phony Peach Eradication.....	$81,176	$85,000	$82,150	- $2,850(1)

(1) Apparent decrease, $2,850 but no decrease in estimated expenditures since savings of $2,850 will be effected under this appropriation during 1932 as a part of the general program for reduction of expenditures.

WORK UNDER THIS APPROPRIATION

In cooperation with the State Board of Entomology of Georgia, the Bureau conducts a campaign for the eradication of the phony disease of peaches, an infectious virus confined to the root system resulting in dwarfed growth of the tree and abnormally small and poorly flavored fruit. Incidental inspections are made in other States where the disease has been found to occur sparingly.

During the past year the inspectors visited 15,955 orchards and inspected 12,232,895 trees, of which 220,526 were found infected; 216,610 of these infected trees were located in Georgia and 3,333 in Alabama, 726 in Louisiana, 376 in Mississippi, 321 in Florida, 205 in Arkansas, 110 in South Carolina, 81 in Texas, 33 in Tennessee, 27 in North Carolina, and 2 in Illinois.

These infected trees are being removed by the State authorities. Under informal cooperation preliminary surveys of peach areas are under way in these States where infections have been found.

(u) PLANT NUTRITION

Funds Available, 1932:
Agricultural Act..... $18,050
Budget Estimate, 1933..... 18,050

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Plant Nutrition Investigations	$17,669	$18,050	$18,050	-------

Savings for 1932 estimated $100 but no reduction in appropriation since similar savings cannot be anticipated for 1933.

WORK UNDER THIS APPROPRIATION

Plant nutrition investigations deal with the great variation in the influence of certain crops on both quality and yield of other crops following in rotation, which is particularly important in the management of the tobacco crop and has an important bearing on the relative plant food requirements both of the tobacco and the crops grown in rotation with it. Studies are also made of the effect of length of day on growth, development and composition of plants including effects of daily duration, intensity and color or composition of the light; the influence of certain crops on other crops following in the rotation; and the plant food elements and the relative plant-food requirements of crops commonly grown in rotation. The work is carried on with the same personnel as Tobacco Investigations.

(v) RUBBER, FIBER AND OTHER TROPICAL PLANTS

Funds Available, 1932:
Agricultural Act..... $140,463
Budget Estimate, 1933..... 115,432
Decrease 25,031*

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Acclimatization and adaptation of crops from tropical regions	$46,798	$48,066	$48,066	---
Rubber production investigations	56,443	58,239	34,708	- $23,531(1)
Fiber plant investigations	32,132	34,158	32,658	- 1,500(2)
	135,373	140,463	115,432	- 25,031*

*Apparent decrease, $25,031; actual decrease in anticipated expenditures, $18,831, as it is contemplated that savings of $6,200 will be effected under this appropriation during 1932 as a part of the general program for reduction of expenditures.

The decrease of $25,031 in appropriations is explained as follows:

(1) "Rubber Production Investigations":

Savings due to operating economies and curtailing of field work (1932 and continued in 1933)	$4,700
Additional reduction, 1933, account of discontinuance of rubber studies in Haiti and conducting work in Florida, California, Arizona and Texas on smaller scale	18,831
	23,531

(2) "Fiber Plant Investigations":

Savings due to operating economies (1932 and continued in 1933)	$1,500

WORK UNDER THIS APPROPRIATION

The work under this appropriation consists chiefly of acclimatization and adaptation of crops from tropical regions, rubber production investigations and fiber production investigations.

Acclimatization and adaptation of crops from tropical regions. Work under this project consists of the investigations leading to growing in the Southern and Southwestern United States of varieties of corn, coffee, cacao, palms, and many other crop plants introduced from tropical regions, for determining their requirements and possibilities of cultivation.

Rubber production investigations. Work under this project consists of the investigation of rubber producing possibilities of plants that may be grown in the United States, its possessions and elsewhere in tropical America, together with development of a system of production that may permit competition with production in the East Indies. The Hevea rubber tree is already growing successfully in southern Florida.

Fiber plant investigations. Work under this project consists of the investigation of hemp and flax fiber production in the United States and of hard fibers such as abaca (Manila hemp), maguey, henequen and sisal in the Philippine Islands, Porto Rico, and the Canal Zone.

Field experiments are carried on at the station of the Division of Cotton Crops and Diseases and cooperative experiments are located at the State Agricultural experiment stations.

(w) SEED INVESTIGATIONS

Funds Available, 1932:
Agricultural Act.....$78,220
Budget Estimate, 1933..... 76,000
Decrease..... 2,220*

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Seed Testing.....	$49,778	$46,750	$45,530	- $1,220(1)
Federal Seed Act.....	24,876	31,220	30,220	- 1,000(2)
International Seed Testing Congress.....	250	250	250	----
	74,904	78,220	76,000	- 2,220*

*Apparent decrease $2,220; actual increase in anticipated expenditures of $1,180, as it is contemplated that savings of $3,400 will be effected under this appropriation for 1932.

The decrease of $2,220 in appropriations is explained as follows:

(1) "Seed Testing":

Savings due to operating economies (1932 and continued in 1933)..... $1,740

(2) "Federal Seed Act":

Savings due to operating economies (1932 and continued in 1933)..... 480

2,220

CHANGE IN LANGUAGE

The change of side title from "Seed Laboratory" to "Seed Investigations" is made in order to more correctly describe this activity.

WORK UNDER THIS APPROPRIATION

The work consists chiefly of research and advice on the problems connected with quality and germination of field seeds. Cooperative seed testing laboratories are maintained at Sacramento, California; Lafayette, Indiana; Columbia, Missouri; and Corvallis, Oregon.

Seed testing. Under this project an advisory service is maintained for farmers, seedsmen, and others interested in seed quality, based upon seed samples tested to determine the proportion of pure seeds present, the kind and proportion of weed seeds, and the germination of the pure seed.

Federal Seed Act. The Federal Seed Act is enforced under this project, requiring the sampling of all importations of field seeds, the coloring of red clover or alfalfa seed of foreign origin, and establishing penalties on misbranding and adulteration of seed in interstate commerce regardless of origin.

International Seed Testing Congress. Under this project participation in the International Seed Testing Congress on the part of the United States is authorized to the extent of $250. The Seed Testing Congress is endeavoring to set up international rules for testing seed to insure uniformity.

(x) SUGAR PLANT INVESTIGATIONS

Funds Available, 1932:	
Agricultural Act.....	$413,700
Budget Estimate, 1933.....	390,262
Decrease.....	23,438*

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Sugar Cane Investigations...	$123,300	$127,220	$120,222	- $6,998(1)
Sugar Beet Investigations...	277,297	286,480	270,040	- 16,440(2)
	400,597	413,700	390,262	- 23,438*

*Apparent decrease, $23,438; actual decrease in anticipated expenditures, $3,638, as it is contemplated that savings of $19,800 will be effected under this appropriation during 1932 as a part of the general program for reduction of expenditures.

The decrease of $23,438 in appropriations is explained as follows:

(1) "Sugar Cane Investigations":

Savings due to operating economies and curtailment of field experiments in 1932 and continued in 1933.....	$6,360
Additional reduction 1933.....	638
	6,998

(2) "Sugar Beet Investigations":

Savings due to operating economies in 1932 and continued in 1933.....	$13,440
Additional reduction 1933.....	3,000
	16,440
	23,438

CHANGE IN LANGUAGE

The change of side title from "Sugar Plants" to "Sugar Plant Investigations" is made in order to more correctly describe this activity.

WORK UNDER THIS APPROPRIATION

Research on the problems connected with the growing of sugar cane and sugar beets in the United States is carried on, including the control of diseases affecting these crops. Field stations and laboratories are maintained at the following points:

Canal Point, Florida.	Twin Falls, Idaho
Cairo, Georgia.	Salt Lake City, Utah.
Houma, Louisiana.	Riverside, California
Guayama, Porto Rico	Fort Collins, Colorado.
	Rocky Ford, Colorado

Sugar cane investigations. Under this project investigations include the study of sugar cane diseases, development of methods for their control, breeding and testing of new varieties of cane for the purpose of developing varieties better adapted to conditions in this country as well as resistant to diseases and capable of furnishing better yields in Louisiana, Florida, and other Southern States.

Sugar beet investigations. Under this project superior yielding varieties are being developed, strains resistant to disease are selected for increase, types of beets better adapted to conditions in this country are produced, experiments involving comparative studies of cultural practices are performed, and special methods for the control of curly-top and other serious diseases, including special investigations in cooperation with the Bureau of Entomology for the control of the curly-top disease of sugar beets caused by the leafhopper.

(y) TOBACCO INVESTIGATIONS

Funds Available, 1932:
Agricultural Act.....$91,000
Budget Estimate, 1933..... 91,000

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Tobacco Investigations.....	$78,676	$91,000	$91,000	---

Savings for 1932 estimated $200 but no reduction in appropriation since similar savings cannot be anticipated for 1933.

WORK UNDER THIS APPROPRIATION

Tobacco investigations include all phases of growing, curing and handling tobacco, with the exception of tobacco insects and their control. The work consists of studies on tobacco diseases and their control, laboratory research on causes of poor quality in leaf tobacco and field investigations in the improvement of methods of growing, curing, and handling the different types of leaf as each distinctive type of tobacco presents special cultural problems.

Cooperative experiments are carried on at the Agricultural Experiment Stations of tobacco-growing States, but no independent field stations are maintained. The allotments for different types of tobacco studies for the fiscal year 1932 are as follows:

Cigar binder and filler production investigations Pennsylvania & Wisconsin	$ 12,120
Flue-cured tobacco investigations, N. Carolina, S. Carolina and Georgia	25,292
Burley tobacco production investigations, Tennessee and W. Virginia	6,930
Maryland tobacco production investigations	$ 3,600
Dark air-cured tobacco production investigations Virginia	2,045
Cigar wrapper tobacco production investigations Mass.,Conn.& Fla.	4,250
Tobacco breeding, physiological studies and tobacco diseases, Arlington Farm, Va.	5,455

(z) WESTERN IRRIGATION AGRICULTURE

Funds Available, 1932:		
1. Agricultural Act	$153,940	
2. 2nd Def. Act, 1931, (Allotment for 1932 from $35,000 for Hermiston, Oregon, Field Station).....	24,800	
Total Appropriation, 1932		$178,740
Budget Estimate, 1933		147,950
Decrease		30,790

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Agronomic Investigations on Irrigation Projects:				
General or Regional Investigations	$15,000	$15,540	$15,540	- - -
Belle Fourche Station, Newell, South Dakota	18,000	16,400	16,400	- - -
Huntley, Montana Station	17,000	15,000	15,000	- - -
Newlands Station, Fallon, Nevada	11,700	10,800	10,800	- - -
Scotts Bluff Station, Mitchell, Nebraska	13,340	11,680	11,680	- - -
San Antonio, Texas Station ...	12,500	11,220	- - -	- $11,220
Umatilla Station, Hermiston, Oregon	13,800	28,400	9,660	- 18,740
Washington State Station, Prosser, Washington	3,500	3,525	3,525	- - -
Phoenix, Arizona Station	6,800	6,800	6,800	- - -
Yuma Field Station, Bard, California	17,400	16,625	16,625	- - -
Total, Agronomic Investigations on Irrigation Projects	129,040	135,990	106,030	- 29,960
Boron Investigations:.....	35,245	37,000	37,000	- - -
Irrigation and Ground Water Investigations:	5,737	5,750	4,920	- 830
	163,925	178,740	147,950	- 30,790 (1)

(1) Apparent decrease $30,790; actual decrease $24,790 since savings of $6,000 are being undertaken in connection with this item during 1932. The decrease of $30,790 for 1933 is explained as follows:

(a)	Decrease, non-recurring item for establishment of Hermiston, Oregon, Field Station	- $24,800
(b)	Increase, making $9,660 in all for operation of Hermiston Field Station	+ 6,060
(c)	Decrease, on account of discontinuance of San Antonio, Texas Field Station	- 11,220
(d)	Decrease, operating economies on project "Irrigation and Ground Water Investigations"	- 830
	Net Decrease	- 30,790

WORK UNDER THIS APPROPRIATION

The agricultural conditions in the arid and semiarid regions of the Western United States are studied to determine by field experiments the crops, rotations, and cropping methods best suited to successful irrigation farming in those regions.

Agronomic investigations on irrigation projects. In cooperation with the Reclamation Bureau of the Department of the Interior and the experiment stations of the States concerned, field experiments are carried on to determine methods of improving conditions of crop production under irrigation for the benefit of the settlers on the reclamation projects.

Boron Investigations. Work under this project consists of investigations relating to injury caused by boron found in irrigation water supplies of southern California and adjoining areas, seriously affecting citrus orchards, alfalfa and other crops, and impairing the productivity of these lands.

Irrigation and ground water investigations. Work under this project consists of analysis of water used for irrigation and recovered by drainage in order to anticipate the danger of crop injury and to determine the effectiveness of drainage works in prevention of salt accumulation in certain lands.

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FOREST SERVICE

CHANGE IN LANGUAGE

The following proviso is inserted in the preamble of the Forest Service section of the appropriation act:

> "Provided further, That the appropriations for the work of the Forest Service shall be available for meeting the expenses of warehouse maintenance and the procurement, care and handling of supplies and materials stored therein for distribution to projects under the supervision of the Forest Service and for sale and distribution to other Government activities, the cost of such supplies and materials including the cost of supervision, transportation and handling to be reimbursed to appropriations current at the time additional supplies and materials are procured for warehouse stocks from the appropriations chargeable with the cost of stock issued;"

This change in language is requested for the following reason:

By letter of April 25, 1931 the Comptroller-General informed the Secretary of Agriculture that the Forest Service had no authority for continuing the so-called Central Purchase warehouses which have been in existence at Missoula, Montana; Denver, Colorado; and Ogden; Utah; for several years. In recognition of the importance of these warehouses to economical administration of the Forest Service activites in the field the Comptroller-General has agreed to their continuance until June 30, 1932 in order that an opportunity may be had for securing the necessary legislation.

The above proviso authorizes the continuance of the warehouses, the carrying over of supplies from one fiscal year to another, and the addition of charges to the original cost of the supplies or equipment to cover the cost of handling.

It would be very unfortunate if these warehouses had to be discontinued. The Forest Service did not establish central purchase warehouses until thoroughly convinced that this method of purchasing was more economical than any other. The economies effected through this method of purchasing have been substantial and to discontinue these warehouses now would be taking a step backward.

(a) GENERAL ADMINISTRATIVE EXPENSES

Funds Available, 1932:	
Agricultural Act.....	$370,640
Budget Estimate, 1933.....	354,180
Decrease.....	16,460

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
General Administration.....	$365,740	$370,640	$354,180	-$16,460(1)

The decrease of $16,460 in appropriation is explained as follows:

(1) Apparent decrease in General Administration, $16,460; actual decrease in anticipated expenditures, $8,460, since an $8,000 saving for 1932 is contemplated as a result of operating economies in connection with this work. This $8,000 is dropped from the appropriation for 1933 and the additional reduction of $8,460 consists of (a) $6,780, to be met by further operating economies, and (b) $1,680 transferred to the appropriation of the Office of the Secretary to cover the salary of a detailed employee.

WORK UNDER THIS APPROPRIATION

This appropriation provides salaries and expenses of employees in the Washington office engaged on general administrative and service-wide sub-technical activities pertaining to the National Forests and other general service activities.

(b) PROTECTION AND ADMINISTRATION, NATIONAL FORESTS

Funds Available, 1932:		
Agricultural Act	$7,289,240	
Second Def. Act, 1931 (Allotment 1932 for Blister Rust Control)	150,000	
Total Appropriation, 1932		7,439,240
Budget Estimate, 1933		7,169,494
Decrease		269,746 *

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Fire Prevention	$2,114,845	$2,170,720	$2,170,720	---
Fire Suppression	299,000	299,000	299,000	---
Construction of Improvements	742,575	742,575	641,689	$-100,886(1)
Maintenance of Improvements	611,000	611,000	564,000	- 47,000(1)
Commercial Timber Sales	785,600	834,600	834,600	---
Timber Sales at Cost	53,000	53,000	53,000	---
Development of Forestry Practice	74,000	74,000	61,000	- 13,000(1)
Timber Survey	161,000	161,000	154,000	- 7,000(1)
Planting	60,000	70,000	67,000	- 3,000(1)
Free Use of Timber	18,000	23,000	22,000	- 1,000(1)
Tree Diseases and Insects	264,000	352,000(a)	395,140	+ 43,140(2)
Administrative Investigations	69,000	69,000	46,000	- 23,000(1)
Grazing Administration	1,016,200	1,051,200	1,004,200	- 47,000(1)
Range Reconnaissance	49,800	49,800	47,800	- 2,000(1)
Fish and Game	145,000	145,000	138,000	- 7,000(1)
Land Adjustments	90,000	93,645	79,645	- 14,000(1)
Land Exchange and Acquisition	114,600	114,600	99,600	- 15,000(1)
Special Uses	207,700	211,700	202,700	- 9,000(1)
General Surveys and Maps	180,000	188,000	170,000	- 18,000(1)
Control Recreation Areas	77,400	85,400	81,400	- 4,000(1)
Administration New Units	20,000	40,000	38,000	- 2,000(1)
	7,152,720(b)	7,439,240	7,169,494	-269,746*

*Apparent decrease, $269,746; actual decrease in anticipated expenditures, $124,846, as it is contemplated that savings of $144,900 will be effected under this appropriation during 1932 as a part of the general program for reduction of expenditures.

(a) Includes $45,000 appropriated in the 1932 Act made available for expenditure in the fiscal year 1931.

(b) Includes $123,900 Equipment and Supplies appropriation which was merged with this appropriation in the fiscal year 1932.

The decrease of $269,746 in appropriations is explained as follows:

(1) The total apparent decreases on the projects designated "(1)" amount to $312,886; actual decreases in anticipated expenditures, $167,986, since a $144,900 saving for 1932 is contemplated as a result of operating economies and curtailment of work in connection with these projects. This $144,900 is dropped from the appropriation for 1933 and the additional reduction of $167,986 will be met by further economies and curtailment or postponement of work. In general, it is anticipated that the reductions will affect all projects or activities under this appropriation approximately in the degree shown in the foregoing project statement.

Increase of $43,140 for White Pine Blister Rust Control:

(2) In the summer of 1930, it was discovered that this deadly, exotic disease of white pines was spreading much more rapidly than had been expected in Northern Idaho, Western Montana and extreme Northeastern Washington. The economic life of this region is dependent on its lumber industry, and that industry is dependent upon the western white pine. This species is also by far the most valuable of any in the National Forests of this section of the country. The previous twenty-year program of cleaning out the alternate hosts of this disease (currents and gooseberries) was wholly inadequate to meet the impending disaster. The appropriation of $45,000 for fiscal year 1932 for work on the National Forests, in the regular Agricultural Appropriation Act, was supplemented by one of $150,000 in the Second Deficiency Act, thus making available a total of $195,000. A further increase of $43,140 for fiscal year 1933 is essential for adequate work in protecting, before it is too late, the present crop and the future production of white pine on 1,500,000 acres of Government-owned lands in the National Forests, as part of a regional program undertaken with the cooperation of the State of Idaho, the private owners and the Bureau of Plant Industry. Full advantage is taken, in this work, of the economical methods developed by the research and experimental work of the Bureau of Plant Industry.

CHANGE IN LANGUAGE

The language in the proviso under the appropriation for National Forest Region 1 has been changed to authorize an expenditure of "not to exceed $500 in caring for the graves of fire fighters buried at Wallace, Idaho, and in removing the remains of fire fighters to the cemeteries at Newport, Washington, and/or St. Maries, Idaho." There are two graves of fire fighters at Newport, Washington, and one at Priest River, Idaho, located in the potters fields and the location of these graves renders it difficult to maintain them properly. It is recommended that the authorization in the Act for the care of the graves of fire fighters be extended so that their bodies may be concentrated in the cemeteries at Newport, Washington and St. Maries, Idaho, with an increase of $300 in the amount of the authorization to cover the expense.

It is recommended that the States of Maryland, New York and New Jersey be omitted under the item for National Forest Region 7, since there are no National Forest areas in these States at the present time and it is not anticipated that there will be in the near future under the acquisition program.

The dropping of the immediately available provision is for the purpose of eliminating this surplus language which was added to the Act for the fiscal year 1932 to provide additional funds for the relief of unemployment prior to June 30, 1931.

WORK UNDER THIS APPROPRIATION

This appropriation is used for the general operating expenses of the National Forests and National Forest Regional Offices, including the following items:

(1) Salaries and travel expenses of the men in charge of the various units of organization such as National Forest Regions, National Forests, and Ranger Districts. There are now nine National Forest Regions, 141 National Forests and 712 Ranger districts. These men direct the administrative, protective and improvement activities carried on in the units for which they individually are responsible and during the course of a year will devote varying portions of their time to practically all of the projects listed. For some of the projects worked on and supervised there are special appropriations, but the salaries and, except under certain special conditions, the travel expenses of the men in charge of administrative units are paid entirely from this appropriation. It would be impossible to exert financial control over the many general and special appropriations if an attempt were made to pay the salaries and expenses of men in charge of physical units from special appropriations in proportion to the varying amounts of time spent on the different projects. This method of financial management accounts for a large part of the charges from this appropriation to projects for which there are special appropriations.

(2) Salaries and expenses of the assistants to these supervisory officers including the salaries of clerical employees. Exceptions are that when such an assistant or clerk is wholly employed on an activity such as tree planting or road construction, for which a special appropriation is available, his salary and any necessary travel expenses are paid from the special appropriation; also when the time of an assistant is divided between work for which there is no special appropriation and work for which there is a special appropriation in a way which calls for adjustment as a matter of law and fairness between appropriations, the cost of his time and travel expense, if any, is so divided.

(3) Salaries of fire guards, scalers and other short-term employees engaged on work for which there is no special appropriation. Three thousand and two fire guards are employed as required by the fire danger in each locality. Periods of employment vary from one to six months and average about three months.

When such work as building or fence construction is needed at the station of a fire guard he is employed on such work if arrangements can be made so that he can be called by telephone when a fire is discovered. Also, if periods of wet weather occur during the fire season, fire guards are used so far as possible on any other work needed, such as improvement work of all kinds. In both of such instances the guard is paid from the special appropriation if funds are available. If the special appropriation concerned is exhausted the guard is nevertheless used on the special work as a matter of good business management, but his wages are paid from the Protection and Administration Appropriation which is used while the man is required for straight fire duty.

(4) Fire Protection equipment is purchased from this appropriation to the extent that funds can be made available therefrom.

(5) Miscellaneous costs of operation, such as rent of offices, telephone and telegraph tolls, freight, express, supplies and equipment not provided by special appropriations.

The activities provided for wholly out of this appropriation include the following:

Fire prevention
Commercial timber sales
Timber sales at cost
Development of forestry practice
Free use of timber
Tree diseases and insects
Grazing administration
Fish and Game
Special uses
General surveys and maps
Control of recreational areas

The activities listed in the project statement for this appropriation for which there are also special appropriations, are given below:

Fire suppression
Construction of improvements
Maintenance of improvements
Timber surveys
Planting
Administrative investigations
Range reconnaissance
Land adjustments
Land exchange and acquisition

(c) FIGHTING FOREST FIRES

Funds Available, 1932:
Agricultural Act.....$100,000
Budget Estimate, 1933..... 100,000

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Fire Suppression.....	$1,295,826	$33,000	$33,000	---
Protection of Lands, Railroad Forfeiture Suits.....	74,174	67,000	67,000	---
	1,370,000	100,000*	100,000	---

*Made available for fiscal year 1931 and expended in that year.

WORK UNDER THIS APPROPRIATION

This appropriation is used primarily for the suppression of forest fires, with the exception of the amount required to give the lands known as the Coos Bay Wagon Road and Oregon and California railroad lands the same protection from fire which is given adjacent National Forest or privately owned lands protected by associations of private owners. Otherwise administrative restrictions placed upon the use of the appropriation by the Forest Service provide that expenditures shall not be made from it until forest fires have actually started. An exception is made to this rule, however, when fire conditions become so critical that the regular protective organization, which is financed from "Protection and Administration, National Forests", is unable to cope with the situation and when, therefore, the temporary employment of additional guards will reduce expenditures for fire fighting. Expenditures are made for the employment of fire fighters and their transportation, equipment needed on going fires when not available in stocks of equipment previously purchased from the Protection and Administration appropriation or in connection with fires of previous years. The appropriation is used for travel expenses of forest guards when going to or returning from fires and for the travel expenses of regular employees of the Service when the travel performed extends beyond the boundaries of the units to which they are regularly assigned or when the activities to which men are assigned do not include fire fighting.

The amount given in the appropriation act is nominal because it is impossible to predict in advance what the expenditures for such an uncertain activity may be. Supplemental estimates are submitted each year for the Deficiency Bill to cover expenditures in excess of the amount appropriated in the regular appropriation act.

(d) AERIAL FIRE CONTROL

Funds Available, 1932:	
Agricultural Act.....	$50,000
Budget Estimate, 1933.....	25,000
Decrease.....	25,000

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Aerial Detection and Reconnaissance of Forest Fires...	$50,000	$50,000	$25,000	$25,000(1)

The decrease of $25,000 in appropriation is explained as follows:

(1) Apparent decrease in Aerial Detection and Reconnaissance of Forest Fires, $25,000; actual decrease in anticipated expenditures, $15,000, since a $10,000 saving for 1932 is contemplated as a result of curtailing expenditures on this activity. This $10,000 is dropped from the appropriation for 1933 and the additional reduction of $15,000 will be met by further curtailing this activity.

WORK UNDER THIS APPROPRIATION

This appropriation is used to operate aircraft in California, Oregon, Washington, Idaho, Montana, Michigan, Minnesota, and Arkansas in forest fire protection work. Beginning with the fiscal year 1929 this activity was carried on by contracting with commercial flyers instead of in cooperation with the War Department. The Forest Service has used aircraft in protection work for twelve seasons. It was at first believed air patrol would afford quicker detection of fires than could be secured by lookout men on towers and mountain peaks. Experience has disproved this as a general proposition. Nor is it surprising that relatively few reports of fires have come from the aircraft, since any one locality is under observation only a short time during the twenty-four hours even if two or three patrols are made daily. Continuous observation of the terrain, such as lookout men on towers and mountain peaks have if intervening topography does not cut off a great part of their view, is essential to effective fire control.

The use of airplanes after lightning storms to search out smoldering fires which might be hidden from ground lookouts by intervening ridges has as yet given disappointing results but the possibilities of this use of aircraft have not been exhausted.

(e) LANDS

Funds Available, 1932:	
Agricultural Act.....	$58,980
Budget Estimate, 1933.....	53,270
Decrease.....	5,710

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Classiciation of National Forest Lands, Location, Survey and Appraisal of Lands to be Acquired by Exchange and Entry Survey of Forest Homesteads.....	$52,500	$58,980	$53,270	-$5,710(1)

The decrease of $5,710 in appropriations is explained as follows:

(1) Apparent decrease in Classification of National Forest Lands, Location, Survey and Appraisal of Lands to be Acquired by Exchange and Entry Survey of Forest Homesteads, $5,710; actually an increase in anticipated expenditures, $4,290, since a $10,000 saving for 1932 is contemplated as a result of curtailment and postponement of work under this appropriation. $5,000 of this $10,000 is dropped from the appropriation for 1933 and the additional reduction of $710 will be met by operating economies. The anticipated increase in actual expenditures over those of the fiscal year 1932 is based primarily upon the probability of a substantial increase in the number of proposed exchanges of private land within National Forests for National Forest land or stumpage.

WORK UNDER THIS APPROPRIATION

Since the inception of this work 691 separate exchanges have been consummated through which the United States has secured title to 1,005,527 acres of land valued at $4,119,156, for which it granted 291,697 acres of land valued at $1,538,278 and 768,563,000 board feet of stumpage valued at $2,096,789. During the calendar year 1930, consummated cases numbered 156; offered lands 225,075 acres valued at $806,172; selected lands 55,551 acres valued at $249,190 and selected stumpage 180,976,000 board feet valued at $432,274. Cases approved by Secretary of Agriculture and forwarded to the Secretary of the Interior for action numbered 157; offered lands 304,906 acres valued at $1,214,216; selected lands 30,890 acres valued at $239,909; and selected stumpage 202,545,000 board feet valued at $570,844.

(f) SANITATION AND FIRE PREVENTION

Funds Available, 1932:
Agricultural Act.....$67,000
Budget Estimate, 1933..... 84,335
Increase..... 17,335

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Construction and Maintenance of Sanitary Facilities and for Fire Prevention on Public Camp Grounds.....	$57,000	$67,000*	$84,335	+$17,335(1)

*Includes $40,000 made available for expenditure in fiscal year 1931.

(1) The increase of $17,335 is needed for the construction of sanitary and fire prevention facilities on public camp grounds.

During calendar year 1930, the number of people who used the National Forests for recreational purposes was estimated to be 31,904,500, e. g., Special Use permittees and guests 326,826; hotel and resort guests 1,330,610; campers 1,980,736; picnickers 3,272,680 and transient motorists 24,993,600. This represents a slight increase over the preceding year and a ten-fold increase over 1917 when the first systematic estimates of recreational use were made. This enormous use of National Forests is not only of outstanding social importance and advantage but it is also the basis of an extensive commercial development, creating markets for services and supplies, which are of nation-wide significance.

It does, however, create hazards to public property and health. Such hazards can effectively be minimized or eliminated by provision of adequate camp grounds affording simple facilities for the control of fire and for good sanitation. The chief purpose of the camp grounds is a protective one; the concentration of risks upon areas where they can be controlled or guarded against. The protective value of camp grounds has repeatedly been demonstrated in the experience of not only the Forest Service but of other protective agencies. To provide these people adequate camping facilities, which will minimize hazards to public health and fire risks, about 2,000 areas have been recognized and designated as public camp grounds. Upon 1,731 of these camp grounds some facilities have been established, principally toilets, garbage pits, sources of water supply, fire places, etc. Public interest demands a more rapid rate of progress in the equipment of these camp grounds. While primarily important as safeguards to public health and property they also secure greater realization of the public services and values of the National Forests and stimulate the commercial development of the regions of which they are parts.

CHANGE IN LANGUAGE

The dropping of the immediately available provision is for the purpose of eliminating this surplus language which was added to the Act for the fiscal year 1932 to afford unemployment relief prior to June 30, 1931.

WORK UNDER THIS APPROPRIATION

This appropriation is used for the purpose of clearing or otherwise preparing areas required as public camp grounds, and to install thereon simple water, sanitary and fire control facilities with a view (a) of concentrating campers upon areas of low sanitary and fire hazard, (b) preventing the occurrence of unsanitary conditions and (c) minimizing risk of fire damage to National Forest timber. Appropriation is prorated between the nine Nation Forest Regions in the same proportion as the estimated cost of the Regional program bears to total cost. Appropriation expended exclusively for materials and labor, no part being used for salaries or overhead.

(g) PLANTING ON NATION FORESTS

Funds Available, 1932:	
Agricultural Act.....	$250,000
Budget Estimate, 1933.....	160,000
Decrease.....	90,000

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Reforestation by Planting of National Forest Areas and Investigations of Planting and Nursery Problems.....	$225,000	$250,000	$160,000	-$90,000(1)

The decrease of $90,000 in appropriations is explained as follows:

(1) Apparent decrease in Reforestation and Nurseries, $90,000; actual decrease in anticipated expenditures, $87,000, since a $3,000 saving for 1932 is contemplated as a result of curtailment of operations in connection with this work. This $3,000 is dropped from the appropriation for 1933 and the additional reduction of $87,000 will be met by further postponement of planting work.

CHANGE IN LANGUAGE

The omission of the words, "the resulting" and "such" from the language of the appropriation is recommended.

These words are confusing in that they may be construed as limiting the use of the appropriation to the protection, care and improvement of plantations and experiments and investigations necessary for seeding and tree planting resulting from the appropriation of the particular year, which limitation would render the provision of little practical value. With the above words omitted the funds appropriated for a given year would be clearly available, as intended, for care and protection of plantations and experiments and investigations of seeding and tree planting regardless of the year in which such work was done.

WORK UNDER THIS APPROPRIATION

Planting on the Nation Forests is resorted to only where it is not possible to obtain regeneration naturally. In sales of National Forest timber provision is made for natural regeneration through the reservation of seed trees. Where fires have repeatedly burned over areas there is nothing left to furnish seed and as a result such areas grow up to a tangle of weeds, brush and light seed tree species of low commercial value. Such areas are planted in order that they may not remain in this non-productive condition for a long period of years.

(h) RECONNAISSANCE

Funds Available, 1932:	
Agricultural Act.....	$131,260
Budget Estimate, 1933.....	78,960
Decrease.....	52,300 *

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Timber Survey.....	$74,800	$79,740	$47,370	-$32,370(1)
Range Reconnaissance.....	46,520	51,520	31,590	- 19,930(2)
	121,320	131,260	78,960	- 52,300*

*Apparent decrease, $52,300; actual decrease in anticipated expenditures, $47,300, as it is contemplated that savings of $5,000 will be effected under this appropriation during 1932 as a part of the general program for reduction of expenditures.

The decrease of $52,300 in appropriations is explained as follows:

(1) Apparent decrease in Timber Surveys, $32,370; actual decrease in anticipated expenditures, $29,370, since a $3,000 saving for 1932 is contemplated as a result of operating economies and curtailments in connection with this work. This $3,000 is dropped from the appropriation for 1933 and the additional reduction of $29,370 will be met by further curtailment of this work.

(2) Apparent decrese in Range Reconnaissance, $19,930; actual decrease in anticipated expenditures, $17,930, since a $2,000 saving for 1932 is contemplated as a result of operating economies and curtailments in connection with this work. This $2,000 is dropped from the appropriation for 1933 and the additional reduction of $17,930 will be met by further curtailment of this work.

WORK UNDER THIS APPROPRIATION

Timber Surveys: The first step in the management of the timber resources of the National Forests is the determination of the kinds and amount of timber available in the different units. When this information is obtained it is possible to group together those units which are logically tributary to the same general lines of transportation which will carry the raw material to a common manufacturing center. Once the boundaries of such a unit of operation are decided upon and an inventory had of the merchantable timber and young growth therein, it is possible to determine the amount of timber which can be removed annually without depleting the growing stock or wood capital. All of this information is brought together in what is termed a forest management plan, and such a plan definitely fixes the annual cut and the timber sale policies and systems of cutting to be followed.

Timber surveys made to procure this information can be comparatively extensive in character since the cut is planned over a long period of years and there will be opportunity for adjustment. Once capital has been interested and the manufacturing plant assured, it is then necessary to put up a block of timber for sale and since the stumpage prices found in the appraisal are largely influenced by the volume of timber to be cut it is essential that an accurate estimate of the timber be obtained. Thus in preparing for sales of timber two types of survey are made: (1) an extensive survey to determine how much timber can be cut from the unit annually (a preliminary examination); and (2) intensive surveys at frequent intervals of portions of the unit to fix the value of the stumpage for individual sales.

Range Reconnaissance: Plans of management are prepared to govern the handling of the forage resources of the National Forests. The range is divided up into grazing allotments - units of a size to accommodate the stock of a single individual or a group of individuals. Each allotment has a plan of management prepared for it fixing the number of stock which can be grazed without reducing the productivity of the area. It provides for the manner in which the stock shall be grazed, the order in which the different units within the allotment shall be grazed as the season progresses, the location of the salt grounds and the supervision necessary to obtain the best utilization of the range.

Most of the grazing allotments at present have a plan of management of some nature but many of them are based on very incomplete information. In

order that the best use of this grazing resource may be obtained surveys are in progress of the areas still to be covered. These surveys determine the number and kinds of forage plants found per acre on the range, their palatability, period of seeding and such related data and furnish a basis for determining the carrying capacity of the different units.

(i) IMPROVEMENT OF THE NATIONAL FORESTS

Funds Available, 1932:	
Agricultural Act	$2,359,200
Budget Estimate, 1933	1,045,840
Decrease	1,313,360

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Protection Improvements	$541,000	$631,000	$609,000	$-22,000(1)
Protection Roads and Trails (b)	1,500,000	1,229,200	-	-1,229,200(2)
Southern California Imprvements	150,000	150,000	100,000	-50,000(3)
Range Improvements	100,000	120,000	116,000	- 4,000(4)
Administrative Improvements	209,000	229,000	220,840	- 8,160(5)
	(b) 2,500,000	2,359,200(a)	1,045,840	-1,313,360*

*Apparent decrease, $1,313,360; actual decrease in anticipated expenditures, $1,288,360, as it is contemplated that savings of $25,000 will be effected under this appropriation during 1932 as a part of the general program for reduction of expenditures.

(a) This includes $494,200 made available for expenditure in 1931.
(b) Exclusive of $3,000,000 provided by Emergency Construction Act.
The decrease of $1,313,360 in appropriations is explained as follows:

(1) Apparent decrease in Protection Improvements, $22,000; actual decrease in anticipated expenditures, $16,000, since a $6,000 saving for 1932 is contemplated as a result of curtailment in expenditures for this work. This $6,000 is dropped from the appropriation for 1933 and the additional reduction of $16,000 will be met by further curtailment of expenditures.

(2) Apparent decrease in Protection Roads and Trails, $1,229, 200; actual decrease in anticipated expenditures, $1,219,200, since a $10,000 saving for 1932 is contemplated as a result of curtailment of expenditures on this work. This $10,000 is dropped from the appropriation for 1933 and the additional reduction of $1,219,200 will be met by further curtailment of expenditures. The curtailment involves the discontinuance during 1933 of work on protection roads and trails out of this appropriation. The progress of the

work programmed under this appropriation for roads and trails was given advancement over that provided in the regular appropriation for 1931 by the appropriation of $3,000,000 in the Emergency Construction Act of December 20, 1930, for the relief of unemployment prior to June 30, 1931.

(3) The appropriation for Southern California Improvements is decreased $50,000, which will be met by curtailing the construction and maintenance of protection improvements in Southern California Forests. It is not anticipated that any savings in this item can be made for the fiscal year 1932, since the work is on a cooperative basis with the State of California, counties, cities and other agencies and the plans of these interests would make any savings in the appropriation already made impracticable.

(4) Apparent decrease in Range Improvements, $4,000; no actual decrease in anticipated expenditures, since a $4,000 saving for 1932 is contemplated as a result of curtailment in expenditures for this work. This $4,000 is dropped from the appropriation for 1933.

(5) Apparent decrease in Administrative Improvements, $8,160; actual decrease in anticipated expenditures, $3,160, since a $5,000 saving for 1932 is contemplated as a result of curtailment in expenditures for this work. This $5,000 is dropped from the appropriation for 1933 and the additional reduction of $3,160 will be met by further curtailment of expenditures.

CHANGE IN LANGUAGE

The dropping of the immediately available provision is for the purpose of elimination of this now surplus language which was added to the bill for the fiscal year 1932 to provide additional funds for the relief of the unemployment prior to June 30, 1931.

The substitution of the word "for" in place of the word "on" just before the words, "the Angeles, Cleveland, Santa Barbara and San Bernardino National Forests in Southern California" is recommended in order to make the language of the proviso consistent with the general language of the Improvement item of which this proviso is a part. Technically interpreted the wording of the proviso would not permit the expenditure of these Improvement funds for fire lines, telephone lines and other protection improvements which extend outside of one of the four Southern California Forests. The language in the general Improvement item preceding this proviso does not restrict expenditures to the area inside the National Forests. To be economically constructed, and effective in protecting the National Forests, fire breaks must be located with reference to prevailing air currents, ridges and probable sources, and direction of fires. Such locations sometimes fall slightly outside the National Forest boundaries. New telephone lines also must connect with existing lines which sometimes involves construction for a few miles outside the boundaries.

The following proviso relative to construction and maintenance of roads and trails is eliminated, since the appropriation has been omitted for 1933:

> "Provided further, That not less than $1,229,200 of this appropriation shall be available only for the construction and maintenance of roads and trails."

WORK UNDER THIS APPROPRIATION

At the present time this appropriation is used for the construction and maintenance of improvements needed for the administration and protection of the National Forests, except camp ground improvements. There is a special appropriation for the latter class of improvements. There is also a separate appropriation for forest roads and trails, a part of which is used for the construction and maintenance of roads and trails of the same general class as those constructed under this item, when funds are provided therefor. The principal classes of improvements constructed and maintained are telephone lines, lookout structures, fire breaks, roads, trails, barns, fences, dwellings and other buildings.

Limited amounts are used for the special protective improvements on the Angeles, Cleveland, Santa Barbara and San Bernardino National Forests in Southern California and for the construction and maintenance of boundary and range division fences and other improvements necessary for the control of stock on the grazing ranges on the National Forests.

(j) FOREST RESEARCH

General Statement - Forest Research

The appropriations recommended for forest research, and more specifically for research in forest management, range investigations, forest products, forest survey, and forest economics for the fiscal year 1933, fall under the provisions and the authorizations of the Forest Research Act approved May 22, 1928 (45 Stat., 699-702).

Except for the forest survey item, Section 9, which provides a maximum as well as an annual authorization, the Act of May 22, 1928, sets up a 10-year financial program which began with the fiscal year 1929 and ends with 1938. The year 1933 will be the fifth year of this program.

Each section of the Act provides for work on an important phase of the forestry problem. Forest management, on how to grow timber crops and protect them against fire; range investigations, on the production and utilization of forest ranges, an important by-product, and also on other ranges; forest products investigations, on the properties, manufacture, and utilization of forest products primarily as an aid to forest land use; the forest survey and other economic investigations, on the formulation of the economic basis for sound forest policies.

All of the above recommendations therefore constitute parts of a comprehensive national and regional attack through research on the forest problems of the United States.

In the broadest sense the objectives of the comprehensive program outlined by the forest research act are to supply a scientific foundation for:

1. The productive use of forest land in the United States, which aggregates about one-fourth of our entire land area, an area nearly as large as that now classified as improved agricultural land.

The productive use of forest lands includes the growing of wood and other forest products sufficient to meet American requirements, which are now nearly half of world requirements. Productive use includes also, in connection with erosion-streamflow investigations, making lands most effective for watershed protection, and for assuring satisfactory production and use of the forage, wild life, recreational, and other forest resources.

Productive use is important because present-day American standards of living require a relatively high per capita consumption of wood, and these standards should not be lowered by a shortage. Productive use is important also because idle land is an economic burden. Surrounding and more prosperous districts must, for example, contribute to the support of the sparse populations through increased taxation. Productive use is important because the permanence of forest industries depends absolutely upon continuous wood supplies. As a group these industries rank about fourth among American industries and have a capitalization of about $3,600,000,000 exclusive of forest land and stumpage worth at least $10,000,000,000 more.

Bringing and maintaining forest lands in productive use is a complex and difficult problem. Within the forest regions of the United States there are wide variations in topographic, climatic, soil, and other conditions. Out of a total of about 850 forest tree species we have something like 63 of high commercial value. The forest management of most European countries deals with only two or three species--fewer, in fact than are found in any one of our important forest regions. Back of European forest practice are many decades or even centuries of tradition. In the United States we are starting from scratch. Conditions affecting production and use of forest ranges are equally variable and complex.

2. The productive use of range land in the United States. Approximately 237 million acres of forest land are grazed in the United States, from which forage constitutes an important by-product. In addition there are about 587 million acres of untimbered range lands. The greater part of this vast area of timbered and non-timbered range land is in the West, where it furnishes about 70 per cent of the feed for the livestock industry of the 11 Western States and a considerable part of the water for the 19 million acres of irrigated land. A large part of it is Federally owned. Most of it outside the National Forests is producing less than 50 per cent of what it is capable, and large areas are probably not producing more than 10 per cent of what they are capable. Utilization of areas adjacent to the Nation Forests has a very direct relationship with the proper handling of the range on the National Forests.

3. Reduction of waste in the manufacture and utilization of wood, which is now responsible for about two-thirds of the annual cut from our forests; and also for the effective utilization of the many species of wood which are consumed by the American public.

The primary benefits accrue to forest land owners by making timber growing more profitable, and to the ultimate consumer of wood through better service.

The difficulty and complexity of forest products work is increased through the large number of American tree species and because of the great variation in the properties of single species. This variation in one sense is a liability, but it may be made an asset through full scientific information.

4. Sound economic forest land policies - Federal, State, regional, etc. Enough information on our forest situation is now available so that we know along broad lines what action must be taken. Detailed policies can not be formulated satisfactorily until authentic and detailed data can be made available.

Forestry activities in the United States are expanding rapidly. Current expenditures by all agencies now probably reach over $40,000,000 a year. Every dollar should be made to count to the utmost. This can be assured only through the sound technical basis which can be obtained through research.

Regional research in forest management, range investigations, the forest survey, and forest economics, and some of the purely local work in forest products, are located at regional Forest Experiment Stations. The Forest Products Laboratory is conducted as a national institution dealing with national utilization questions, those which require laboratory facilities, and the local products research which does not justify a permanent local staff.

(j) RESEARCH IN FOREST MANAGEMENT

Funds Available, 1932:	
Agricultural Act.....	$562,000
Budget Estimate, 1933.....	535,080
Decrease.....	26,920*

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Allegheny Forest Experiment Station, headquarters at Philadelphia, Pennsylvania.....	$ 31,470	$ 31,520	$31,120	- $ 400 (1)
Appalachian Forest Experiment Station, headquarters at Asheville, North Carolina.....	45,220	45,120	44,520	- 600 (2)
California Forest Experiment Station, headquarters at Berkeley, California.....	63,910	63,720	61,820	- 1,900 (3)
Central States Forest Experiment Station, headquarters at Columbus, Ohio.....	30,760	30,710	30,210	- 500 (4)
Intermountain Forest and Range Experiment Station, headquarters at Ogden, Utah.....	10,000	9,750	9,550	- 200 (5)
In the Rocky Mountain Region.....	5,300	5,300	----	- 5,300 (6)
Lake States Forest Experiment Station, headquarters at St. Paul, Minnesota.....	66,373	80,490	76,890	- 3,600 (7)
Northeastern Forest Experiment Station, headquarters at Amherst, Massachusetts.....	28,870	47,900	47,400	- 500 (8)
Northern Rocky Mountain Forest and Range Experiment Station, headquarters at Missoula, Montana....	20,697	34,900	34,600	- 300 (9)
Pacific Northwest Forest Experiment Station, headquarters at Portland, Oregon.....	29,580	43,680	35,780	- 7,900 (10)
Southern Forest Experiment Station, headquarters at New Orleans, Louisiana.....	82,200	81,950	79,750	- 2,200 (11)
Southwestern Forest and Range Experiment Station, headquarters at Tucson, Arizona.....	10,300	12,660	12,460	- 200 (12)
Washington, D. C.....	69,650	74,300	70,980	- 3,320 (13)
	(a)494,330	562,000	535,080	- 26,920*

* Apparent decrease, $26,920; actual decrease in anticipated expenditures, $8,920, since it is contemplated that savings of $18,000 will be effected under this appropriation during 1932 as a part of the general program for reduction of expenditures. The savings in 1932 are being made up through lapses of salary due to delays in filling vacancies caused by resignations or transfers and to delays in appointments to new positions created by increased appropriations, and are being made currently by curtailing travel and other operating expenses in the above projects during the year where and as opportunity is afforded, and in such a way as to cause least interference with the organization and the work.

(a) Includes $4,000 transfer from Equipment and Supplies appropriation which was merged with this appropriation in fiscal year 1932.

The decrease of $26,920 in appropriations is explained as follows:

(1) The decrease of $400 in Forest Management investigations at the Alleghany Forest Experiment Station will be met by curtailment of travel and other operating expenses.

(2) The decrease of $600 in the Forest Management investigations at the Appalachian Forest Experiment Station will be met by the curtailment of travel and other operating expenses.

(3) The decrease of $1,900 in Forest Management investigations at the California Forest Experiment Station will be met as follows: $900 through the reduction of travel and other operating expenses; and $1,000 through the curtailment in scale of present work on Redwood Management as provided in the Appropriation Act for the fiscal year 1931.

(4) The decrease of $500 in Forest Management investigations at the Central States Forest Experiment Station will be met through curtailment of travel and other operating expenses.

(5) The decrease of $200 in Forest Management investigations at the Intermountain Forest and Range Experiment Station will be met through curtailment of travel and other operating expenses.

(6) The decrease of $5,300 in Forest Management investigations in the Rocky Mountain Region will be met by the postponement of present work until financial conditions permit its resumption.

(7) The decrease of $3,600 in Forest Management investigations at the Lake States Forest Experiment Station will be met as follows: $1,000 through the reduction of travel and other operating expenses; and $2,600 through the postponement, until financial conditions permit resumption, of planting investigations in the Northern Plains as provided in the 1932 Appropriation Act.

(8) The decrease of $500 in Forest Management investigations at the Northeastern Forest Experiment Station will be met by the curtailment of travel and other operating expenses.

(9) The decrease of $300 in Forest Management investigations at the Northern Rocky Mountain Forest and Range Experiment Station will be met by the curtailment of travel and other operating expenses.

(10) The decrease of $7,900 in Forest Management investigations at the Pacific Northwest Forest Experiment Station will be met as follows: $400 through a reduction of travel and other operating expenses; and $7,500 through the postponement until financial conditions permit, of investigations of Forest Fires as provided in the Appropriation Act for 1932.

(11) The decrease of $2,200 in Forest Management investigations at the Southern Forest Experiment Station will be met as follows: $1,000 by curtailment of travel and other operating expenses; $500 by curtailing work until finances permit investigations of Bottomland Hardwoods management as provided for in the 1931 Appropriation Act; and $700 by curtailing work until finances permit full resumption of work on a Study of Methods of Cutting in Second-growth Pines as provided in the Appropriation Act for 1931.

(12) The decrease of $200 in Forest Management investigations at the Southwestern Forest and Range Experiment Station will be met by the curtailment of travel and other operating expenses.

(13) The reduction of $3,320 in Forest Management investigations in washington, D. C., will be met - $720 by curtailing travel and by other operating expenses; and $2,600 by not filling until the financial situation will permit a vacancy hitherto used for assistance to the field stations in the compilation of data.

WORK UNDER THIS APPROPRIATION

The purpose of investigations in forest management is to find out how to grow, manage and protect from fire timber crops of the unusually large number of species which make up our forests and under the widely different conditions found in the United States. The work is conducted primarily at a series of regional Forest Experiment Stations, one for each of the major forest regions of the United States. The work includes investigations of the production, extraction, storage, germination, etc., of forest tree seed, of the technique for producing forest tree seedlings

in nurseries, and for field planting under widely varied conditions; of methods of cutting mature timber so as to insure prompt natural reforestation of the best species in the shortest space of time; of cultural measures such as thinning and weeding to insure rapid and quality growth of the best trees throughout the life of the stand; of the rate at which various species and combinations of species grow on different sites; of the conversion of the ragged and inferior forest resulting from destructive cutting and fire into rapidly growing forests of desirable species; of the cultural methods necessary for the production of such by-products as naval stores. Investigations in fire protection cover the determination of the standards and organization necessary for effective protection, of the damages caused by fire under different forest and other conditions, and of the basis for a satisfactory technique for fire suppression.

The character of the results obtained is illustrated by the following. The planting of Norway pine under aspen stands in the Lake States is inadvisable because of insufficient light, while from 35 to 60 per cent of spruce and white pine will survive. Since enormous areas now bear only aspen stands, these facts are of great importance in conversion to forests of the original species. It has been found that the life of Douglas fir seed is comparatively short after seed fall, probably not more than a year. Under ordinary conditions seed is not scattered much more than a thousand feet from seed trees. A high percentage of the seed trees are lost from fire and blow down after cutting. All of these facts indicate the necessity for leaving groups of seed trees of considerable size in order to insure reforestation in the Douglas fir forests. In the spruce forests of the Northeast it has been found necessary in order to insure perpetuation of the spruce which is so valuable for pulp to protect the seedlings and young trees already on the ground in logging, otherwise the stand under many conditions is converted into less valuable hardwoods. It has also been found where worthless hardwoods retard the growth of the more valuable spruce that they may be eliminated by the poisoning or cutting or girdling, the former being cheapest and equally effective. Under average conditions in Wisconsin white pine will produce over 35,000 board feet to the acre in 60 years, and on the best sites nearly 60,000 board feet. On the best sites in well-stocked thrifty stands in northern Georgia yellow poplar grows at the rate of over 650 board feet an acre, whereas stands badly wrecked by culling, fire, and disease have a growth rate of less than 90 board feet an acre. The use of the Fench method of wounding trees for naval stores production has been found experimentally to give a gum yield 20 to 30 per cent higher than by American methods, and the development of a new turpentine tool makes it possible to use common woods labor. Through a better understanding of the characteristics of lightning storms it is now possible for fire lookouts in the West to classify storms as safe or dangerous several hours before fires are started. About one-third of the lightning storms cause fires. Duff moisture appears to be the best actual criterion of fire danger in the Northeast in the absence of actual fires.

(k) RANGE INVESTIGATIONS

Funds Available, 1932:	
Agricultural Act.....	$130,000
Budget Estimate, 1933.....	124,130
Decrease.....	5,870*

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
California Forest Experiment Station, headquarters at Berkeley, California.....	----	$ 19,000	$ 18,650	- $ 350 (1)
Intermountain Forest and Range Experiment Station, headquarters at Ogden, Utah.....	37,550	37,550	33,530	- 4,020 (2)
Northern Rocky Mountain Forest and Range Experiment Station, headquarters at Missoula, Montana....	----	9,500	9,400	- 100 (3)
Southwestern Forest and Range Experiment Station, headquarters at Tucson, Arizona.....	26,950	40,590	40,190	- 400 (4)
Washington, D. C.....	21,260	23,360	22,360	- 1,000 (5)
	(a)85,760	130,000	124,130	- 5,870*

* Apparent decrease $5,870; actual decrease in anticipated expenditures, $1,870, since it is contemplated that savings of $4,000 will be effected under this appropriation during 1932 as a part of the general program for reduction of expenditures. The savings will be made by delaying appointments to vacancies and new positions and by reduced travel and other operating expenses during the year where and as opportunity is afforded in the above projects, in such a way as to cause least interference with the organization and the work.

(a) Includes $400 transfer from Equipment and Supplies appropriation which was merged with this appropriation in fiscal year 1932.

The decrease of $5,870 in appropriations is explained as follows:

(1) This $350 decrease in range investigations at the California Station will be met by curtailment of travel and other operating expenses.

(2) This $4,020 decrease in range investigations at the Intermountain Station will be met by curtailment of travel and other operating expenses, and by withholding the filling of a position now vacant until the financial situation will permit, and hitherto used for investigations of spring-fall ranges.

(3) The decrease of $100 in range investigations at the Northern Rocky Mountain Station will be met by curtailment of travel and other operating expenses.

(4) The decrease of $400 in range investigations for the Southwestern Station will be met by curtailment of travel and other operating expenses.

(5) The decrease of $1,000 in Washington, D. C., will be obtained by curtailing travel and other operating expenses during 1933.

CHANGE IN LANGUAGE

It is recommended that the following language be omitted:

"of which not to exceed $10,000 may be expended for range utilization research in cooperation with the United States Range Livestock Experiment Station at Miles City, Montana."

The general authority in the McSweeney-McNary Act (45 Stat., 699) which is specifically referred to under the Range Investigations item, is ample authority to do the work and to cooperate with the Range Livestock Experiment Station, and the appropriation is being spent in the manner called for by the proviso. The special language above quoted is therefore no longer necessary.

WORK UNDER THIS APPROPRIATION

The object of range investigations is to determine how to produce and utilize forage crops on forest and range lands most effectively. The work is now confined to the California, Intermountain, and Southwestern Forest and Range Experiment Stations, and on a smaller scale to the Northern Rocky Mountain Forest and Range Experiment Station. Range investigations include the determination of suitable methods for restoring and maintaining native forage crops, and the proper utilization of these crops by domestic livestock; the correlation of grazing management with timber production; artificial reseeding of range lands with cultivated and native forage plants; range livestock management, including systems of handling different classes of livestock, water development, salting, etc.; and the determination of methods for eradication or control of poisonous plants.

The following examples illustrate the character of the results which are being obtained. Analysis of 17 years' work on restoration of depleted mountain range lands of central Utah shows the close relationship between depletion of soil, following destruction of vegetation by overgrazing, and the ability of the range to recover. Areas where the soil was badly depleted in 1915 and which as a result produced annual weeds chiefly, have recovered slowly and now produce a scant stand of grasses with other herbaceous perennials and require 10 acres to support a cow a month. Areas on which the soil was less depleted and on which only a scant stand of grasses could be grown 17 years ago now produce a good stand of grass and other palatable herbs, and require 2 acres to support a cow a month, thus furnishing 5 to 6 times as much grazing capacity as formerly. Similarly, results on the Santa Rita Experimental Range in Arizona show that where palatable range plants are still abundant the range may be restored to a good stand of grass in from 3 to 5 years. On range from which palatable plants have been eliminated and the soil depleted by erosion, it may require 20 years or more for

restoration. Since the range forage crop may be reduced as much as 60 per cent in dry years as compared to good years, the range should not be stocked with a breeding herd in excess of the feed available in dry years. By such conservative grazing and by providing reserve pastures for critical periods each year, a breeding herd has been maintained on the experimental area throughout a 16-year period and the range is now in excellent condition. Contrasted to this the number of cattle on unfenced adjacent ranges, usually overgrazed, varied greatly during the same period, the average number was much less than on an equal area of the experimental range, and the outside ranges are now badly depleted. The more adequate feed on the experimental range has largely been responsible for calf crops almost half again as large, death losses one-third, and larger and more salable animals from the experimental range as compared to the outside ranges. Sowings of yellow sweetclover, crested wheat grass, and some native grasses on depleted ranges of the dry oak-brush zone of central Utah have proven these plants to be vigorous, rapid growing and drought-resistant plants which can furnish feed in spring and fall and withstand heavy grazing remarkably well under the conditions prevailing on the area.

(1) FOREST PRODUCTS

Funds Available, 1932:	
Agricultural Act.....	$641,300
Budget Estimate, 1933.....	615,840
Decrease.....	25,460*

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
California Forest Experiment Station, headquarters at Berkeley, California.....	$ 17,550	$ 17,960	$ 17,760	- $ 200 (1)
Northern Rocky Mountain Forest and Range Experiment Station, headquarters at Missoula, Montana...	15,500	14,910	14,210	- 700 (2)
Pacific Northwest Forest Experiment Station, headquarters at Portland, Oregon.....	19,320	19,220	17,720	- 1,500 (3)
Forest Products Laboratory, headquarters at Madison, Wis.....	531,580	531,580	511,020	- 20,560 (4)
Washington, D. C.....	57,330	57,630	55,130	- 2,500 (5)
	(a)641,280	641,300	615,840	- 25,460*

* Apparent decrease $25,460; actual decrease in anticipated expenditures, $15,460, since it is contemplated that savings of $10,000 will be effected under this appropriation during 1932 as a part of the general program for reduction of expenditures. The $10,000 saving in 1932 is being made by not filling vacant positions; by curtailing travel, and the purchase of equipment; by a reduction in the employment of temporary labor; and by transfers to enable obligated work to be carried on. The curtailment of operating expenses is being made during the year in the various above projects where and as opportunity is afforded so as to cause the least interference with the organization and the work.

(a) Includes $2,000 transfer from Equipment and Supplies appropriation which was merged with this appropriation in fiscal year 1932.

The decrease of $25,460 in appropriations is explained as follows:

(1) The decrease of $200 at the California Forest Experiment Station will be met by a curtailment of travel and other operating expenses.

(2) The decrease of $700 at the Northern Rocky Mountain Forest and Range Experiment Station will be met by a curtailment of travel and other operating expenses and a reduction in the employment of temporary field assistants.

(3) The decrease of $1,500 at the Pacific Northwest Forest Experiment Station will be met by curtailment of travel and other operating expenses, and by not filling for the present a technical staff position now vacant and hitherto used in studies of means for reducing waste in logging and milling in the Douglas fir region.

(4) The decrease of $20,560 in forest products investigations at the Forest Products Laboratory will be met as follows: $2,560 through curtailment in travel and other operating expenses, $5,000 by curtailment of work on pulping experiments on southern woods, $5,000 by curtailment of pulping experiments on western woods, $3,000 by curtailing naval stores investigations, and $5,000 by curtailment of mill scale studies, until finances permit resumption of work on an enlarged basis.

(5) The decrease of $2,500 in Washington will be met by a curtailment of travel and other operating expenses, and by not filling for the present a position now vacant and needed for the effective supervision of the work.

WORK UNDER THIS APPROPRIATION

The general aim of forest products research is to aid in making timber growing more profitable through more efficient utilization, and to aid in providing the public most economically with needed forest products in the form which will render the most satisfactory and efficient service. The enlargement of merchantable yields, the utilization of waste, and of species now considered inferior and worthless, and the development of new uses and improved practices are involved. The determination of the chemical composition and physical structure, strength, and other properties of all of our numerous American species is required and how these are affected and may be controlled by conditions of growth. The work also must determine how harvesting and manufacture may be conducted most efficiently and how wastes may be reduced or eliminated. Means must be determined for the selection of material which will take full advantage of the variability in the 30 or more properties of each species and avoid the handicaps of this variability. Closely related is the problem of determining the properties

which are important in each type of wood use and the selection of the most suitable and economical woods for each. The work involves the development of methods for modifying wood material, such as making it more resistant against decay, less inflammable, and of developing improved methods of seasoning, storing, and handling from mill or factory to the ultimate consumer. The work must cover the adaptation of material to service through improvement of design in building and other construction. Finally, another group of problems involve the conversion of wood into chemical and fibrous materials such as pulp, paper, fiber board, plastics, etc., and the production and utilization of products such as naval stores.

The following examples illustrate the kind of results which are being obtained. Favorable results previously obtained in the production of strong white pulps from Southern loblolly pine were practically duplicated with longleaf, slash, and sand pines by a modified sulphite or kraft process. This process was also applied to western woods and gave very satisfactory results with Douglas fir, Good bleached pulps suitable for book and bond papers were produced. Slash pine as a raw material for newsprint is receiving earnest consideration in many quarters. Experiments this year demonstrated that the commercial sulphite process gives satisfactory results from slash pine free from heartwood, and earlier investigations have shown that ground wood pulp of satisfactory color and average strength can be produced from young slash pine with reasonable power expenditure.

Based on a nation-wide survey of the moisture content of wood in dwellings, regional averages of the moisture in various wooden house parts from cellar to attic have been determined. These regional averages indicate the proper moisture content of wood to be used in interior consturction in various parts of the country and should aid materially in reducing the troubles experienced in shrinking, swelling, and opening of joints of wood in service, which are due in part to using the lumber at a moisture content too high or too low for the humidity conditions of the particular locality.

Studies of the strength of various types of wooden columns built up of comparatively short pieces nailed together showed results varying from 27 to 91 per cent of the strength of the solid wood columns. These results indicate the possibility of replacing solid wooden columns of any required strength with somewhat larger columns built up of cheap material and also the possibility of mass production at the mill of columns in long lengths that may be difficult to obtain in solid material.

Six-year exposure tests have shown that the relative life of paints now generally used on wood is determined in large part by the characteristics of the wood itself. A leaflet has been published explaining this relation and classifying American softwoods according to their paint-holding power.

The results of a logging and milling study on second-growth shortleaf and loblolly pine in Arkansas showed the greatest returns per acre when only trees 12 inches in diameter and upwards were cut. Similar studies on old field loblolly pine in Louisiana gave a diameter of 15 inches and upwards for higest returns per acre. In studies made in Virginia and North Carolina on loblolly pine, the lowest diameters for maximum returns were 12 inches and 11 inches, respectively.

An experiment portable dry kiln was tested on two locations with charges of southern pine. From the results of these runs it is probable that a practical kiln design can be developed for the use of small mill operators so that the large amount of lumber produced at these mills can be marketed in better and more salable condition. It was shown that by greater care in the adjustment of set works on the carriage of small sawmills the value of salable lumber can be increased by as much as $1.60 per thousand. Particular attention was given to the kiln drying of Douglas fir and drying schedules were worked out for the wide clear grade to secure rapid drying with minimum damage to stock. The data on several years study of Douglas fir seasoning are now being analyzed and assembled for publication in bulletin form. Experiments demonstrating the efficacy of increased air movement in the drying of Douglas fir were instrumental in inducing producers to adopt this year the first moisture specification applying to that species.

(m) CONSTRUCTION FOREST PRODUCTS LABORATORY

Funds Available, 1932:	
Agricultural Act.....	$800,000
Budget Estimate, 1933.....	----
Decrease.....	800,000

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Forest Products Laboratory Building	$100,000	$800,000	----	- $800,000

The decrease of $800,000 in appropriations is explained as follows:

There is a reduction for 1933 because of the fact that the appropriation for 1932 completes the full authorization of $900,000 for the building.

CHANGE IN LANGUAGE

The following paragraph should be eliminated since the Appropriation Act for 1932 completes the full authorization for the Forest Products Laboratory building:

> "For carrying out the provisions of the Act entitled 'An Act to provide for the acceptance of a donation of land and the construction thereon of suitable buildings and appurtenances for the Forest Products Laboratory, and for other purposes,' approved April 15, 1930 (46 Stat., pp. 167-168), $800,000, which amount shall be immediately available."

(n) FOREST SURVEY

Funds Available, 1932:	
Agricultural Act.....	$200,000
Budget Estimate, 1933.....	172,080
Decrease.....	27,920*

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
California Forest Experiment Station, headquarters at Berkeley, California.....	$ 5,000	$ 8,500	$ 7,400	- $ 1,100 (1)
Lake States Forest Experiment Station, headquarters at St. Paul, Minnesota.....	8,000	10,000	8,840	- 1,160 (2)
Northern Rocky Mountain Forest and Range Experiment Station, headquarters at Missoula, Montana....	----	19,000	14,500	- 4,500 (3)
Pacific Northwest Forest Experiment Station, headquarters at Portland, Oregon.....	74,700	75,000	67,300	- 7,700 (4)
Southern Forest Experiment Station, headquarters at New Orleans, La..	23,500	61,500	48,040	- 13,460 (5)
Washington, D. C.....	13,800	26,000	26,000	- - -
	125,000	200,000	172,080	- 27,920*

* Apparent decrease $27,920; acutal decrease in anticipated expenditures, $17,820, since it is contemplated that savings of $10,000 will be effected under this appropriation during 1932 as a part of the general program for reduction of expenditures. The savings in 1932 are being made up through lapses of salary due to delays in filling vacancies caused by resignations and transfers, and by delays in appointments to new positions, and are being made currently during the year by curtailing travel and other operating expenses in each of the above projects where and as opportunity is afforded and in such way as to cause the least interference with the organization and the work.

The decrease of $27,920 in appropriations is explained as follows:

(1) The decrease of $1,100 will be met by curtailment in travel and other operating expenses and in the employment of temporary field assistants during the field season.

(2) The decrease of $1,160 will be met by curtailment in travel and other operating expenses, and in the employment of temporary field assistants during the field season.

(3) The decrease of $4,500 will be met by curtailment in travel and other operating expenses; and by postponing filling a permanent technical position.

(4) The decrease of $7,700 will be met by curtailment in travel and other operating expenses, and in the employment of temporary assistants during the field season.

(5) The decrease of $13,460 will be met by curtailment in travel and other operating expenses; by the reduction of employment of temporary assistants during the field season; and by postponing filling three technical positions, until financial conditions make it possible to resume work on an enlarged basis.

WORK UNDER THIS APPROPRIATION

The Forest Survey is a comprehensive and detailed appraisal of the nation's present and future requirements for timber, pulp and paper, naval stores, and other forest products, the present and potential growth and the existing volume and quality of timber, and the area and condition of forest land. It is designed to lay a broad foundation of facts as a basis for sound economic forest land use in the United States, and to supply the detailed facts necessary to balance our national timber budget. It is one of the most far-reaching undertakings in the field of forestry.

The Survey consists of four phases: (1) The Timber Resource Inventory, by far the most expensive and time consuming; (2) Determination of Growth; (3) A Determination of Rate of Depletion and; (4) A study of Timber Requirements. The work which commenced in 1930, is still in its early stages and has thus far been concerned primarily with the timber inventory phase, although it has been initiated for the other phases. Except for the requirements work which can be effectively headed up in Washington on a country-wide basis, the Survey is prosecuted largely on a regional basis under the respective Forest Experiment Stations.

Pacific Northwest

Excellent progress has been made on the inventory phase both for publicly and privately owned timber and it is estimated that field work in the Douglas fir forests will be 75 per cent complete by the close of the current fiscal year. This has been greatly facilitated by excellent cooperation, including access to their cruises, of individual land owners and logging companies. Upon completion of the Douglas fir forests it is planned to extend field work into the pine forests of eastern Washington and Oregon.

Southern

The inventory work is under way in both the bottomland hardwoods and the pine forests, particularly in Louisiana and Mississippi. The absence of reliable comprehensive local cruises and information in general, particularly in the hardwoods, has necessitated intensive study of technique in field methods to enable authoritative cruises within the present and prospective financial limitations of the authorization. The Southern region is the largest and in many respects the most complicated forest region

in the United States. An indication of local interest in the Survey is the fact that the State of Mississippi through its Research Commission has tentatively provided to allocate $25,000 to the Survey.

Northern Rocky Mountain

Work has been initiated this year in this region and will follow in a general way the procedure worked out in the Pacific Northwest for the use of available public and private cruises supplemented and coordinated by field work as necessary.

Lake States

The Survey here is able to take advantage of the extended work of the State Land Economic Surveys, particularly in Michigan. These surveys, previously made, have to be supplemented by additional field data on volume and as a basis for growth computation. Effective cooperation and coordination has been arranged in the further prosecution of these local studies so that with the minimum of expense the additional information needed for the Forest Service may be secured in so far as the areas to be covered by the State surveys are concerned. This has been secured so far at small expense to the Federal government in comparison with the large state expenditures.

California

Aided by extensive state cooperation the work has continued on a comprehensive cover type map which forms a basis for much of the inventory and other work and which is closely associated with the needs of other projects being carried on by the station and with economic projects of the Gianinni Foundation. A new region of the state, namely the redwood region, is being commenced this year.

(o) FOREST ECONOMICS

Funds Available, 1932:	
Agricultural Act.....	$75,000
Budget Estimate, 1933.....	71,040
Decrease.....	3,960

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease	
Lake State Forest Experiment Station, headquarters at St. Paul, Minnesota.....	- - -	$ 7,900	$ 7,740	- $ 160	(1)
Pacific Northwest Forest Experiment Station, headquarters at Portland, Oregon.....	- - -	20,900	19,100	- 1,800	(2)
Southern Forest Experiment Station, headquarters at New Orleans, Louisiana.....	$22,800	30,700	28,850	- 1,850	(3)
Washington, D. C.....	27,200	15,500	15,350	- 150	(4)
	50,000	75,000	71,040	- 3,960	

The decrease of $3,960 in appropriations is explained as follows:

(1) The decrease of $160 at the Lake States Station will be met by curtailment in travel and other operating expenses.

(2) The decrease of $1,800 at the Pacific Northwest Station will be met by curtailment in travel and other operating expenses and in employment of technical assistants during the field season.

(3) The decrease of $1,850 at the Southern Station will be met by curtailment in travel and other operating expenses and by replacement of a high by a lower salaried technical position.

(4) The decrease of $150 in Washington will be met by curtailment in travel, and other operating expenses.

WORK UNDER THIS APPROPRIATION

This appropriation includes work in the field of Forest Economics other than that which is specifically provided for elsewhere. This excludes work on the Forest Survey which is provided for under Section 9 of the McSweeney-McNary Act and Forest Insurance and Forest Taxation provided for by the Clarke-McNary Act. Work under this appropriation involves, for the fiscal year 1931, the three major projects: Financial Aspects of Private Forestry Practice, the Development of Private Forestry, and the New Public Domain.

Financial Aspects of Private Forestry Practice

This is the first comprehensive investigation of the costs and returns to be secured from the application by private land owners of forestry practices in varying intensity and under different sets of conditons. It is basic to the coordination of forestry, agriculture and other major uses in successful regional and national land use programs. The study thus far has been conducted by the Southern Forest Experiment Station. The preliminary or exploration phase of the project has been devoted to a careful analysis of forest conditions and forest land management practices, economic and financial, in eleven sample southern counties. Preliminary reports, mostly by individual counties, are in various stages of completion and publication, These studies all show that in southern agricultural sections the forests are contributing far more income to land owners and labor than has been realized. They are, as a rule, receiving inadequate care and their productivity is declining. The work will be continued during the coming year by more intensive analysis of costs and returns and of factors affecting these by a study of a wide range of individual cases. Attention will be given to the ways of successfully meeting the obstacles which appear to obstruct the development of private forestry in the south.

Development of Private Forestry

This study is closely related to the preceding one. It involves a survey of private forestry in various regions and in the United States as a whole; the factors and conditions responsible for forest devastation as well as those handling or favoring commercial forest management; and a study of feasible ways and means of stopping forest devastation and of speeding up the development of private forestry practices with a minimum of public regulation. In the current fiscal year work has been concentrated largely under the Pacific Northwest Forest Experiment Station where an intensive study has been made of the potentialities for applying the principles of selective logging to the Douglas fir type. This has involved an exhaustive study of the costs and returns from logging and manufacturing of trees and logs of different sizes and species and under a variety of silvicultural and physical conditions, and of the operating efficiency of every type of logging machinery. It is found that much of the heavy machinery which has been particularly destructive of the forest also results in high logging costs. As much as 50 per cent of the timber which has been cut on the average logging operation in normal times was uneconomically cut and should have been left for further growth. The results of this study promise to be of revolutionary economic significance to the Pacific Northwest forestry industries individually and as a basis for a more conservative and more profitable handling of forest lands throughout the region.

New Public Domain

The new public domain is being created largely by the abandonment of cutover forest land which is reverting to the public through tax delinquency. It is one of the major economic problems confronting several regions. The study aims to ascertain the causes for the large reversion to public ownership and to contribute to the formulation of plans for handling and using

these lands. It will mean classifying them as to further use, whether private enterprise can resume control and what obstacles are in the way, and, for those areas where public ownership is inevitable, it will set up criteria on which to base speedy allocation to Federal, state or local control in order to make these regions again contribute productively to public welfare. Preliminary exploration studies largely of location, extent and rate of reversion are now being made by the Lake States and Southern Forest Experiment Stations within their respective territories. It is planned to commence work in the Pacific Northwest in the immediate future. The work will be extended to consider more particularly the causes, etc., during the coming year.

(p) FOREST FIRE COOPERATION

Funds Available, 1932:	
Agricultural Act.....	$1,775,000
Budget Estimate, 1933.....	1,611,580
Decrease.....	163,420*

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease	
Forest Taxation and Forest Insurance.....	$ 80,200	$ 80,200	$ 66,120	- $14,080	(1)
Cooperation with States in Forest Fire Prevention and Suppression..	1,619,300	1,694,800	1,545,460	- 149,340	(2)
	1,699,500	1,775,000	1,611,580	- 163,420*	

* Apparent decrease, $163,420; actual decrease in anticipated expenditures, $123,420, as it is contemplated that savings of $40,000 will be effected under this appropriation during 1932 as a part of the general program for reduction of expenditures.

The decrease of $163,420 in appropriations is explained as follows:

(1) The apparent decrease in Forest Taxation and Insurance actually involves the Forest Taxation study only. There will be no actual decrease in anticipated expenditures since a $14,080 saving for 1932 is contemplated as a result of curtailment of operating expenses and curtailment of expenditures through reduction in personnel on this work. This $14,080 is dropped from the appropriation for 1933.

(2) Apparent decrease $149,340; actual decrease in anticipated expenditures, $123,420, since a $25,920 saving for 1932 is contemplated as a result of operating economies and curtailment of expenditures on this work. This $25,920 is dropped from the appropriation for 1933 and the additional reduction of $123,420 will be met by further curtailment of expenditures through reductions in allotments to the states.

STATE SUMMARY OF ALLOTMENTS

Effect of Decrease of $149,340 in Federal Appropriation
F. Y. 1933 for Forest Fire Cooperation under Sec. 2
of the Clarke-McNary Law

State	Estimated cost to protect State and private forest land	Funds budgeted for protection F.Y. 1932 all sources	Federal Allotments F.Y. 1932	Distribution of decrease proposed for F.Y. 1933	Indicated total Federal allotments F.Y. 1933
Maine	$ 342,000	$ 325,554	$ 52,082	$ 4,904	$ 47,178
N. H.	131,000	74,564	17,322	1,631	15,691
Vt.	57,000	20,544	7,694	724	6,970
Mass.	169,000	149,127	32,440	3,054	29,386
R. I.	17,000	11,947	2,310	210	2,100
Conn.	76,000	75,108	13,218	1,244	11,974
N. Y.	378,000	307,931	72,421	6,818	65,603
N. J.	128,000	125,570	26,300	2,476	23,824
Pa.	364,000	279,020	51,934	4,890	47,044
Del.	12,000	3,435	1,318	124	1,194
Md.	73,000	50,460	11,583	1,091	10,492
Va.	397,000	93,965	35,730	3,364	32,366
W. Va.	312,000	104,169	30,988	2,918	28,070
N. C.	632,000	148,540	56,880	5,355	51,525
S. C.	378,000	76,845	34,020	3,203	30,817
Ga.	775,000	164,897	69,750	6,567	63,183
Fla.	847,000	165,689	78,671	7,407	71,264
Ala.	573,000	106,418	55,320	5,208	50,112
Miss.	563,000	84,708	38,200	3,597	34,603
La.	434,000	150,664	50,400	4,745	45,655
Texas	434,000	98,060	41,855	3,941	37,914
Okla.	165,000	35,964	16,470	1,551	14,919
Ark.	484,000	----	----	----	----
Ohio	60,000	25,007	7,261	683	6,578
Ind.	84,000	8,000	7,560	712	6,848
Ill.	77,000	----	----	----	----
Ky.	212,000	34,160	19,080	1,796	17,284
Tenn.	245,000	49,309	24,960	2,350	22,610
Mo.	347,000	----	----	----	----
Mont.	190,000	105,001	28,705	2,703	26,002
Idaho (N)	420,000	345,110	61,141	5,756	55,385
S. D.	4,500	5,122	1,125	106	1,019
N. Mex.	26,000	7,141	2,413	227	2,186
Idaho (S)	27,000	19,900	4,900	461	4,439
Calif.	969,000	791,938	161,298	15,186	146,112
Nevada	14,000	7,201	1,220	115	1,105
Hawaii	5,000	4,184	466	44	422
Wash.	632,000	476,407	105,503	9,933	95,570
Ore.	584,000	427,488	98,392	9,264	89,128
Mich.	662,000	513,140	123,390	11,617	111,773
Wisc.	390,000	195,118	47,453	4,468	42,985
Minn.	697,000	348,360	94,493	8,897	85,596
Total	$13,386,500	6,015,765	1,586,266	149,340	1,436,926
		(Contingent for allotment to new States			20,534
Other items		(Administration and inspection			88,000
		(Forest Taxation Inquiry			56,120
		(Forest Insurance Project			10,000
		Total appropriation indicated.....			1,611,580

WORK UNDER THIS APPROPRIATION

Investigations of forest taxation and forest insurance --

The purpose of investigations in forest taxation is to establish the fundamental principles upon which forest taxation should be based and to cooperate with States in working out legislation which will conform to these principles, and at the same time be adapted to local requirements. The work involves the collection and analysis of data on such subjects as: The economic and legal background of the entire system of taxation in individual States; the financial structure and existing tax system of States, counties and minor political subdivisions; expenditures for roads, schools and other governmental functions; the practical operation of the taxation system in general, including its effect on different classes of property, assessment practices, etc.; existing State forest tax legislation; the actual effect of existing laws on the use of land for growing timber; methods and results of forest tax legislation in European countries where forestry is well established.

Analysis of data collected in the three Lake States, in Washington and Oregon, in New Hampshire and in North Carolina, was completed and partly presented in Progress Reports of which 17 will have been issued by the end of this year. A study of the results of existing forest tax legislation in the United States was completed; the study of forest tax conditions in Europe was also completed. The major effort of the Inquiry during the current year is the preparation of a comprehensive report bringing together the results of the fundamental researches of the Inquiry to date and presenting the conclusions as to principles and as to the most effective application to different sets of conditions. It is planned to continue the work of the Inquiry by more localized application studies looking toward the assistance of states in desirable modifications in existing forest taxation legislation.

The purpose of forest insurance investigations is to determine under what conditions in the United States forest insurance is now feasible and to work out a satisfactory basis and form forsuch insurance. The work consists of the collection, where not already available, and analysis of such data as: Statistics of forest fires, including information as to causes, location, seasons, weather conditions, condition of the forest cover, etc.; appraisal of the damage caused by fire in the different types of forest, under different conditions; ratios of loss to values at stake, as a basis for insurance rating schedules.

Work during 1931 is being concentrated in Washington and Oregon. It largely involves the determination of accurate rates. Organization reports on 1500 fires are being analyzed. The inadequacy of the statistics thus available has necessitated the collection of supplementary data from detailed analysis in the field of the effects of fires, separate studies of climate and protection, reference to miscellaneous fire records on both private and public lands, and the collection, analysis and study of a mass of loss data from private owners. The study will continue in the Pacific Northwest during the coming year.

Cooperation with States in forest fire prevention and suppression --

In the fiscal year 1932, the Federal Government is assisting 37 States and 1 Territory to prevent and suppress forest fires within their boundaries. The administration of this activity is handled in each State by the State Forestry Department; the Federal Government provides a proportion of necessary funds and brings to the States for their consideration and aid the composite experience and knowledge gained through nation-wide contact with the forest fire problem. The experience of the individual States and of the Federal Government on the National Forests is made available to all of the States. This is accomplished by a field personnel of District Forest Inspectors located at Amherst, Massachusetts; Washington, D. C.; Asheville, N. C.; New Orleans, Louisiana; and Louisville, Kentucky; and through the Regional headquarters in the Lake States and in the West.

The Washington office is kept informed of this activity by plans, budgets, and reports submitted by the cooperating States. The plans and budgets are carefully considered and must have the joint approval of the Federal Government and the States before they are put into effect. The expenditures reported by the States are the basis for the receipt by the States of their share of the Federal appropriation. A careful checking of the bookkeeping records of each cooperating State is one of the tasks of each District Forest Inspector.

During the calendar year 1930, 70,832 fires were handled by the State organizations. These burned an area of 4,788,000 acres of forest land and 1,021,000 acres of other land. Because of the extreme drouth conditions existing during a large portion of 1930 in the States east of the Mississippi, the number of fires reported on protected lands was greater than for any preceding year. However, as evidence of the increasing efficiency of the State organizations, it is worthy of note that the average area of forest land burned over per fire amounted to only 67 acres in 1930 as compared with the 1926-1930 average of 79 acres. Although the area of forest land in the cooperating States receiving protection is constantly increasing, the latest figures indicate that there are still about 189,000,000 acres unprotected. The most recent estimates indicate that during 1930 over 120,000 fires occurred on this unprotected land, burning an area in excess of 46,000,000 acres. Although the States are making constant efforts to expand their protected areas, material accomplishment along this line can be secured only through the availability of additional State and Federal funds.

Progress in cooperative forest fire protection is roughly indicated by the following expenditures:

	Year 1911	Year 1930
Total cooperative expenditures	$ 257,000	$6,841,000
State and private expenditures	220,000	5,452,000
Federal expenditures	37,000	1,389,000
Number of States and Territories cooperating	11	38
Area, State and private, protected(acres)	61,000,000	227,000,000

(q) COOPERATIVE DISTRIBUTION OF FOREST PLANTING STOCK

Funds Available, 1932:	
Agricultural Act	$95,000
Budget Estimate, 1933	79,960
Decrease	15,040

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Cooperation with States in the Procurement, Production, and Distribution of Forest Tree Seeds and Plants in Establishing Windbreaks, Shelter Belts, and Farm Woodlots upon Denuded or Non-forested Lands	$93,000	$95,000	$79,960	-$15,040(1)

The decrease of $15,040 in appropriation is explained as follows:

(1) The decrease of $15,040 in this appropriation will be met principally through curtailment in the amounts of cooperation extended to States for the procurement, production and distribution of forest tree seeds and plants in establishing windbreaks, shelter belts, and farm woodlots upon denuded or non-forested lands. During 1932 it probably will not be possible to reduce the expenditures under this heading in view of the allotment program to States having been formulated and the liability incurred.

WORK UNDER THIS APPROPRIATION

Partly due at least to the stimulation afforded by Federal funds, the cooperating States distributed 26 million trees to farmers during the calendar year 1930, sufficient for planting 26,000 acres of land. These trees are furnished to farmers at a reasonable cost. Their planting represents direct action aimed at the profitable utilization of farm lands which are submarginal for agricultural use. In these projects, just as in the fire cooperation projects, the work is administered directly by the State agencies; the Forest Service inspects, advises, and correlates. During the calendar year 1930 the Federal Government expended $73,273 in this project and the States $293,508, a total for both agencies of $366,781. Since the termination of the calendar year 1930, the State of West Virginia has entered into a cooperative project of this kind with the Federal Government. In addition to the distribution of trees to farmers, the States involved are carrying on a much wider distribution to others than farmers for the reforestation of forest land. During 1930 the total distribution of trees by States was 79,320,000.

(For State summary, see next page.)

FUNDS BUDGETED BY STATES AND TERRITORIES FOR
COOPERATIVE DISTRIBUTION OF FOREST PLANTING STOCK TO FARMERS
UNDER SEC. 4, CLARKE-MCNARY LAW, FISCAL YEAR 1932

State	Total State funds*	State funds devoted to cooperative project	%Total output to farmers	Federal allotment	Total
Maine	$ 1,500.00	$ 1,500.00	100	$ 1,500.00	$ 3,000.00
New Hampshire	15,822.46	6,911.23	50	2,000.00	8,911.23
Vermont	10,000.00	2,000.00	33-1/3	2,000.00	4,000.00
Massachusetts	38,000.00	8,000.00	25	2,000.00	10,000.00
Connecticut	8,000.00	2,000.00	40	2,000.00	4,000.00
New York	254,004.00	23,600.40	10	2,000.00	25,600.40
New Jersey	27,288.00	18,501.60	70	2,000.00	20,501.60
Pennsylvania	43,460.00	20,730.00	50	2,000.00	22,730.00
Delaware	3,700.00	2,275.00	75	2,000.00	4,275.00
Maryland	8,375.00	3,187.50	50	2,000.00	5,187.50
Virginia	4,014.00	2,811.20	80	2,000.00	4,811.20
West Virginia	6,000.00	2,800.00	60	2,000.00	4,800.00
North Carolina	5,570.00	3,896.00	80	2,000.00	5,896.00
South Carolina	5,912.70	2,747.62	60	2,000.00	4,747.62
Georgia	2,000.00	2,000.00	100	2,000.00	4,000.00
Florida	4,350.00	3,080.00	80	2,000.00	5,080.00
Alabama	1,223.75	1,001.25	90	1,001.25	2,002.50
Mississippi	600.00	600.00	100	600.00	1,200.00
Louisiana	12,818.00	3,927.00	40	2,000.00	5,927.00
Oklahoma	4,428.00	4,428.00	100	2,000.00	6,428.00
Ohio	19,500.00	8,750.00	50	2,000.00	10,750.00
Indiana	19,490.00	10,034.40	56	2,000.00	12,034.40
Iowa	3,000.00	2,000.00	80	2,000.00	4,000.00
Kentucky	5,000.00	2,667.00	66-2/3	2,000.00	4,667.00
Tennessee	4,065.00	4,065.00	100	2,000.00	6,065.00
Porto Rico	10,750.00	6,925.00	70	2,000.00	8,925.00
Montana	5,050.00	3,287.50	75	2,000.00	5,287.50
Idaho	928.00	928.00	100	928.00	1,856.00
North Dakota	7,963.33	5,472.50	75	2,000.00	7,472.50
Nebraska	11,825.00	11,825.00	100	2,000.00	13,825.00
Kansas	9,825.00	2,138.00	35	2,000.00	4,138.00
Colorado	2,330.00	2,330.00	100	2,000.00	4,330.00
Wyoming	1,522.50	1,522.50	100	1,522.50	3,045.00
Utah	1,300.00	1,300.00	100	1,300.00	2,600.00
California	12,057.00	437.00	7	437.00	874.00
Hawaii	46,990.00	9,301.60	24	2,000.00	11,301.60
Washington	4,325.00	2,427.50	70	2,000.00	4,427.50
Oregon	2,000.00	2,000.00	100	2,000.00	4,000.00
Michigan	8,312.00	6,249.60	80	2,000.00	8,249.60
Wisconsin	12,200.00	2,260.00	30	2,000.00	4,260.00
TOTALS	645,298.74	201,917.40		73,288.75	275,206.15

Administration	$ 3,150.00
Contingent for allotments to new States	18,561.25
Total appropriation	95,000.00

*This column includes all State funds available for tree production and distribution.

(r) ACQUISITION OF LANDS FOR PROTECTION OF WATERSHEDS OF NAVIGABLE STREAMS

Funds Available, 1932:	
Agricultural Act	$2,000,000
Budget Estimate, 1933	245,940
Decrease	1,754,060

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Examination and Purchase of Additional Forest Lands at Headwaters of Navigable Streams	$2,000,000	$2,000,000	$245,940	-$1,754,060(1)

The decrease of $1,754,060 in appropriation is explained as follows:

(1) Apparent decrease in Examination and Purchase of Additional Forest Lands at Headwaters of Navigable Streams, $1,754,060; actual decrease in anticipated expenditures, $1,454,060, since $300,000 saving for 1932 is contemplated as a result of curtailing purchases. This $300,000 is dropped from the appropriation for 1933 and the additional reduction of $1,454,060 will be met by further postponement of purchases of lands. The amount of the estimate for 1933 is to cover salaries and expenses of the staff engaged in acquisition proceedings under funds heretofore appropriated.

CHANGE IN LANGUAGE

The language is changed to cite the Act of June 2, 1930, which authorizes the appropriation for the fiscal year 1933, instead of the Act of April 30, 1928, erroneously referred to in the appropriation for the fiscal year 1932.

WORK UNDER THIS APPROPRIATION

1. Determination by the Forest Service and the Geological Survey of the areas meeting the provisions of the applicable laws.

2. Establishment of local organizations to conduct purchase work.

3. Determination of land ownerships, values, etc.

4. Receipt of proposals of sale; examination, cruise and appraisal of lands, preparation of reports.

5. Presentation of cases for consideration of National Forest Reservation Commission.

6. Surveys of lands approved by Commission.

7. Title examinations, preparation of records of title, institution of condemnation proceedings, presentation of cases for approval by Attorney General.

8. Cash payments to vendors for lands vested in United States.

Work now being conducted in the States of Alabama, Arkansas, Florida, Georgia, Louisiana, Kentucky, Maine, Michigan, Minnesota, Mississippi, New Hampshire, North Carolina, Oklahoma, Pennsylvania, South Carolina, Tennessee, Vermont, Virginia, West Virginia and Wisconsin.

Within the States named 40 Purchase Areas have been authorized by the National Forest Reservation Commission. These contain a gross area of 15,375,806 acres, of which 13,454,935 acres are believed to be chiefly valuable for forest purposes, and suitable for administration as National Forests. Of this area 7,157,766 acres are, or are in process of becoming National Forest land. The lands reserved from the unappropriated public domain, acquired by exchange, or acquired by transfer from other Departments aggregate 2,482,746 acres. The lands purchased or in process of purchase total 4,675,620 acres. The additional lands needed to consolidate the areas in Federal ownership and carry out the purposes of the law total 6,297,169 acres.

PERMANENT INDEFINITE APPROPRIATIONS AND SPECIAL FUNDS

(s) REFUNDS TO DEPOSITORS, EXCESS OF DEPOSITS NATIONAL FORESTS FUND

Funds Available, 1932:
Permanent Indefinite Appropriation.....$75,000
Budget Estimate, 1933..... 75,000

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Refunds	$131,561	$75,000	$75,000	-

WORK UNDER THIS APPROPRIATION

All money received, by or on account of the Forest Service for timber, or from any other source of forest-reservation revenue, is covered into the Treasury of the United States as a miscellaneous receipt; and there is appropriated so much as may be necessary to make refunds to depositors of money deposited by them in excess of amounts found actually due from them to the United States, and so much as may be necessary to refund to the rightful claimants such sums as may be found to have been erroneously collected for the use of lands, or for timber or other resources sold from lands located within, but not a part of, the National Forests, or for alleged illegal acts done upon such lands, which acts are subsequently found to have been proper and legal.

(t) NATIONAL FOREST RESERVATION COMMISSION

Funds Available, 1932
Permanent Specific Appropriation....$500
Budget Estimate, 1933..... 475
Decrease..... 25

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Expenses of National Forest Reservation Commission and its Members	$647	$500	$475	-$25 (1)

The decrease of $25 in the appropriation is explained as follows:

(1) A decrease of $25 in expenditures in the fiscal year 1933 is contemplated as a result of operating economies.

WORK UNDER THIS APPROPRIATION

A sum sufficient to pay the necessary expenses of the commission and its members, not to exceed an annual expenditure of $25,000, has been appropriated, to be paid out on the audit and order of the president of the commission, which audit and order is conclusive and binding upon all departments as to the correctness of the accounts of the commission.

(u) PAYMENTS TO STATES AND TERRITORIES, NATIONAL FORESTS FUND

Funds Available, 1932:	
Special Fund	$1,600,000
Budget Estimate, 1933	1,240,000
Decrease	360,000

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Payment of 25% of National Forest Receipts to States in which National Forests are Situated	$1,677,559	$1,600,000	$1,240,000	-$360,000(1)

The decrease of $360,000 in appropriation is explained as follows:

(1) Apparent decrease, $360,000; no actual decrease in anticipated expenditures, since a $360,000 reduction for 1932 has been effected, as a result of a decline in the receipts from the National Forests in the fiscal year 1931, on which the appropriation for 1932 is based. It is anticipated that the receipts for the fiscal year 1932 will be approximately the same as for 1931, thus similarly affecting the 1933 appropriation.

WORK UNDER THIS APPROPRIATION

Twenty-five per cent of all money received from each National Forest during any fiscal year is paid at the end thereof by the Secretary of the Treasury to the State or Territory in which the National Forest is situated, to be expended as the State or Territorial legislature may prescribe for the benefit of the public schools and public roads of the county, or counties in which the National Forest is situated. When any National Forest is in more than one State or territory or county, the distributive share to each from the proceeds of the forest is proportionate to its area therein.

(v) COOPERATIVE WORK, FOREST SERVICE

Funds Available, 1932:
Special Fund.....$1,700,000
Budget Estimate, 1933..... 1,700,000

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Construction of Improvements	$1,596,262	$1,124,000	$1,124,000	-
Maintenance of Improvements	65,000	65,000	65,000	-
Prevention and Suppression of Forest Fires	325,000	295,000	295,000	-
Disposal of Brush and Other Debris in Timber Sale Operations	160,000	160,000	160,000	-
Forest Investigations	42,000	40,000	40,000	-
Refund to Depositors	16,000	16,000	16,000	-
	2,204,262	1,700,000	1,700,000	-

WORK UNDER THIS APPROPRIATION

All moneys received as contributions toward cooperative work in forest investigations, or the protection and improvement of the National Forests, including deposits received from timber purchasers to cover the cost to the United States of disposing of brush and other debris resulting from cutting operations in sales of National Forest timber, are covered into the Treasury of the United States and constitute a special fund, which is appropriated and made available until expended as the Secretary of Agriculture may direct, for the payment of the expenses of the investigations, protection, or improvements of the Forest Service, and for refunds to the contributors of amounts paid in by them in excess of their share of the cost of investigations, protection, or improvements.

(w) PAYMENTS TO SCHOOL FUNDS
ARIZONA AND NEW MEXICO, NATIONAL FORESTS FUND

Funds Available, 1932:
Special Fund.....$40,000
Budget Estimate, 1933.....40,000

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Payments to the Common School Funds of Arizona and New Mexico on Account of Receipts from State Lands Administered as Parts of National Forests	$41,316	$40,000	$40,000	-

WORK UNDER THIS APPROPRIATION

At the close of each fiscal year there is paid by the Secretary of the Treasury to each of these two States, as income for its common-school fund, such proportion of the gross proceeds of all the National Forests within the State as the area of lands granted to the State for school purposes within these forest reserves may bear to the total area of all National Forests within these States.

(x) ROADS AND TRAILS FOR STATES, NATIONAL FORESTS FUND

Funds Available, 1932:	
Special Fund (Estimate).....	$600,000
Budget Estimate, 1933.....	500,000
Decrease.....	100,000

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Construction and Maintenance of Roads and Trails Within the National Forests	$763,032	$600,000	$500,000	-$100,000 (1)

The decrease of $100,000 is explained as follows:

(1) The decrease of $100,000 in the fiscal year 1933 is due to a decline in the receipts from the National Forests. The amount available for expenditure under this item is determined by the total receipts from the National Forests in the preceding year, since it represents 10 per cent of the receipts. Since the estimated receipts for 1932 are $5,000,000, the amount of the estimated appropriation for 1933 will be $100,000 less than the estimated expenditure for the fiscal year 1932.

WORK UNDER THIS APPROPRIATION

The appropriation is used for the construction and maintenance of roads and trails within the National Forests.

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Note:- Also see Miscellaneous Section for "Forest Roads and Trails", and "Soil Erosion Investigations".

BUREAU OF CHEMISTRY AND SOILS

CHANGE IN LANGUAGE IN INTRODUCTORY PARAGRAPH.

"For all necessary expenses connected with the investigations, [and] experiments, and demonstrations hereinafter authorized, independently or in cooperation with other branches of the Department of Agriculture, other departments or agencies of the Federal Government, States, State agricultural experiment stations, universities and other State agencies and institutions, counties, municipalities, business or other organizations and corporations, individuals, associations and scientific societies, including the employment of [investigators, local and special agents, assistants, experts, clerks, draftsmen, and labor] necessary persons and means in the city of Washington and elsewhere; [official traveling expenses, materials, tools, instruments, apparatus, repairs to apparatus, chemicals, furniture, office fixtures, stationery, gas, electric current, telegraph and telephone service, express and freight charges,] rent outside the District of Columbia, and [for all] other necessary supplies and expenses, and for erection, alteration and repair of buildings outside of the District of Columbia at a total cost not to exceed $5,000, as follows:

Explanation

The wording of the introductory paragraph in the 1932 Appropriation Act is the same as that formerly used by the Bureau of Soils. The modification proposed for 1933 is along the line provided for several of the other bureaus.

Where identical or very similar wording was repeated under several of the appropriation items, such as the clauses covering cooperation, this wording has been omitted from the separate items and a comprehensive statement applicable to all the succeeding paragraphs has been inserted in the introductry paragraph.

Authority is now carried in the Color Investigations appropriation as follows: "including repairs, alterations, improvements or additions to a building on the Arlington Experimental Farm," and recommendation is submitted that this authority be carried in the introductory paragraph and made applicable to all buildings of the Bureau outside the District of Columbia. Since new stations have been established, authority in accordance with the foregoing recommendation is very necessary in view of the decisions of the Comptroller relating to the erection and repair of small buildings.

MERGER OF SUB-APPROPRIATIONS.

With a view to more closely associating lines of work, the Budget estimate also proposes that the separate sub-appropriation "Sirup and Sugar Investigations" be combined with "Agricultural Investigations", where much of the carbohydrate work has been conducted.

It is also recommended that the farm fires work, heretofore conducted under "Dust Explosions and Farm Fires" be also transferred to "Agricultural Investigations".

It is proposed also to combine the heretofore separate items for "Soil Chemistry" and "Soil Physics" since the work is so closely related.

With a view to ready reference for comparative purposes, a statement showing amounts appropriated in 1932 and the amounts estimated for 1933 for the several subappropriations is submitted, as follows, further detailed information relating thereto being shown under the respective items:

Subappropriations	1932 Appropriations	1933 Estimates
General Administration	$ 59,060	97,220
Agricultural Investigations	465,150	459,299
Color Investigations	93,460	90,960
Sirup & Sugar Investigations	37,700	-
Insecticides & Fungicides Investigations .	128,400	118,400
Dust Explosions and Farm Fires	51,700	36,390
Naval Stores Investigations	72,306	69,806
Soil Chemistry	42,760)	61,390
Soil Physics	18,660)	
Fertilizer Investigations	378,400	360,835
Soil Survey	328,705	311,705
Soil Microbiology	43,820	43,755
Soil Fertility	227,080	210,080
TOTAL	1,947,201	1,859,840

(a) GENERAL ADMINISTRATIVE EXPENSES

Appropriation 1932	$59,060
Budget, 1933	97,220
Increase	38,160

This is an apparent increase only. Funds totaling $38,540 are transferred from the following appropriations which have been reduced accordingly, and a reduction of $380 made in traveling expenses:

a.	Agricultural Investigations	$16,975
b.	Fertilizer Investigations	7,565
c.	Soil Survey	7,000
d.	Soil Fertility	7,000
	Total	38,540

The present appropriation of $59,060 for general administrative expenses represents substantially no increase over the amount provided for the same purpose for the former Bureau of Soils, which had in the last year of its separate existence a total personnel of approximately 205 and a total appropriation of $588,480, as compared with the present personnel of approximately 600 and the present aggregate appropriation in excess of $2,000,000. The reorganization creating the Bureau of Chemistry and Soils through combining several scientific branches of the Department has made necessary a larger personnel to carry on the enlarged administrative work, and there has been a corresponding increase in miscellaneous expenses. Since no additional funds were provided, it was found necessary to charge to the several sub-appropriations certain personnel and miscellaneous overhead expenses. In order to simplify bookkeeping and provide the appropriation under the heading "General Administration" it is proposed to clarify the situation at this time by the transfer of funds as indicated.

The respective sub-appropriations have been reduced accordingly and there is no increase involved.

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
General Administration . .	$86,816	$97,600(a)	$97,220	- $380*

*Apparent decrease for 1933, $380, but no actual decrease since savings totaling $760 are being undertaken under this item during 1932. The decrease proposed for 1933 is based upon a general reduction in traveling expenses.

(a) Includes $38,540 transferred from other sub-appropriations in 1933.

WORK UNDER THIS APPROPRIATION

This appropriation provides for the salaries and expenses of the office of the Chief of Bureau and the business organization units, such as Accounting, Personnel, Editorial, Supplies, etc. It is for the purpose of maintaining general administration and direction of the Bureau.

(b) AGRICULTURAL INVESTIGATIONS

Funds Available, 1932:		
1. Agricultural Act..	$465,150	
Transfers proposed in 1933 Budget from -		
2. Sirup & Sugar Investigations .	+37,700	
3. Dust Explosions & Farm Fires .	+15,200	
	$518,050	
Transfer proposed to -		
4. General Administration	-16,975	
Total Appropriation, 1932		$501,075
Budget Estimate, 1933		459,299
Decrease		41,776

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Carbohydrates	$ 79,575	$ 87,410	$ 87,410	-
Food Research	163,970	181,689	176,689	-$ 5,000 (1)
Industrial Farm Products.	66,450	147,932	112,932	- 35,000 (2)
Lignin	14,270	14,855	14,855	-
Oil, Fat and Wax	17,680	18,515	16,739	- 1,776 (3)
Protein and Nutrition . .	33,680	35,474	35,474	-
Farm Fires	14,566	15,200	15,200	-
	390,191	501,075	459,299	- 41,776*

*Apparent decrease for 1933, $41,776; but no decrease in estimated expenditures since savings and postponements totaling $55,430 are being undertaken under this item during 1932, as a part of the general program for reduction of expenditures. During the fiscal year 1932 certain new activities, for which increases were allowed, will be in process of organization, and substantial savings are possible, but by 1933 the work will have progressed to a stage where savings equal to those for the current year will not be feasible.

The decrease of $41,776 in appropriations is explained as follows:

(1) Food Research:

Savings 1932, continued for 1933, and money dropped from estimate by reduction of allocation for citrus by-product research in Texas $5,000

(2) Industrial Farm Products:

Savings 1932, continued for 1933, and money dropped from estimate by establishing farm waste investigations headquarters at Ames, Iowa, on basis of $40,000 annual expenditures 35,000

(3) Oil, Fat and Wax:

Savings due to operating economies (1932 and continued in 1933) 1,776

41,776

CHANGE IN LANGUAGE

The purpose of the changes recommended in the general wording of this paragraph is to provide authorization for certain lines of work (sirup and sugar, farm fires, etc.) now conducted under separate subappropriations but proposed to be merged with this appropriation for 1933,

and to give a more accurate and comprehensive statement of the lines of activity for which money is appropriated.

The revised paragraph is as follows:

"Agricultural chemical investigations: For conducting the investigations contemplated by the Act of May 15, 1862 (U. S. C., title 5, secs. 511, 512), relating to the application of chemistry to agriculture; for the biological, chemical, physical, microscopical, and technological investigation of foods, feeds, drugs, and insecticides and substances used in the manufacture thereof, including investigations of the physiological effects of such products; for the investigation and development of methods for the manufacture of sugars and sugar sirups and the utilization of new agricultural materials for such purposes; for investigation of the action and changes produced by microorganizms, including molds and fungi; for investigation and development of methods for the utilization of agricultural wastes and residues, in cooperation with the Bureau of Standards, Department of Commerce, without duplication of work; for investigation and development of methods for the prevention of heating of agricultural products and the prevention of farm fires and fires in cotton gins, cotton oil mills, grain elevators, and other structures, and to cooperate with associations and scientific societies in the development of methods of analysis."

It is recommended that the sirup and sugar item be transferred to Agricultural Chemical Investigations. Prior to the specific appropriation covered in that item money had been allocated under Agricultural Chemical Investigations for some sugar work, but as a result of a special need for certain sirup and sugar investigations in Louisiana, a separate item was set up for those particular investigations. It is confusing to continue to keep it as a separate item.

For similar reasons it is recommended that the farm fire item be transferred to Agricultural Chemical Investigations. Because some work on farm fires had been done in connection with the plant-dust explosions work, the appropriation for study of farm fires resulting from spontaneous heating of hay was included originally with the dust explosion item.

The added language pertaining to the other lines of work is for the purpose of making the appropriation cover the activities which have been added from year to year, but which are not covered by the original language of the act.

WORK UNDER THIS APPROPRIATION

The activities under this appropriation include investigations relating to the application of chemistry to agriculture to further the utilization of agricultural products, including the raw materials and the waste products therefrom; development of industrial uses for agricultural products; improvement of methods of handling and preparation of known products and development of new products having commercial value; reducing wastes and preventing losses through spoilage, deterioration, and destruction; studies on carbohydrates, including sugars, sirups, honey, starches, and other products; fundamental chemical investigations of foods, studies of the biological changes in raw and manufactured

foods, preservation and deterioration of foods, and investigation of new uses for food by-products, surplus and waste materials; estimation of food value of foods and feedstuffs with special reference to their protein and vitamin content; investigations of hides and skins, tanning materials, leather, farm fabrics, paper, and farm wastes such as cornstalks, straw, and hulls; research on lignin; investigation of oils, fats, and waxes, including the development of new sources and recovery from other agricultural waste products; studies on the spontaneous heating of hay and other agricultural products; and the prevention of farm fires.

(c) COLOR INVESTIGATIONS

Funds available, 1932:	
Agricultural Act	$93,460
Budget Estimate, 1933	90,960
Decrease	2,500

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Color and Farm Waste . .	$81,550	$93,460	$90,960	-$2,500(1)

(1) Apparent decrease for 1933, $2,500; but no decrease in estimated expenditures since savings totaling $3,850 are being undertaken under this item during 1932 through postponements and operating economies in accordance with the general program for reduction of expenditures.

CHANGE IN LANGUAGE

The language in the current act pertaining to cooperation and to repairs and improvements to buildings is omitted for 1933 since these matters are now comprehensively covered in the introductory paragraph.

WORK UNDER THIS APPROPRIATION

The activities under this appropriation consist of investigations and experiments in the utilization of materials produced in the United States, in the production of vat dyes, biological stains, and valuable chemicals. This work includes research on dye synthesis and the preparation and improvement of vat-dye intermediates; analysis and certification of biological stains; and synthesis of new stains having antiseptic and therapeutic value.

Studies are also being conducted on the production of chemicals by the fermentation processes through the action of molds and similar microorganisms on agricultural products such as xylose and dextrose, and the processes which give satisfactory results are being developed on a semiplant scale.

(d) SIRUP AND SUGAR INVESTIGATIONS

Funds Available, 1932:	
1. Agricultural Act	$37,700
Transfer proposed in 1933 Budget to, and merger with:	
2. Agricultural Investigations . .	-37,700
Total Appropriation, 1932	- - -
Budget Estimate, 1933	- - -

(e) INSECTICIDES & FUNGICIDES INVESTIGATIONS

Funds Available, 1932:	
Agricultural Act	$128,400
Budget Estimate, 1933	118,400
Decrease	10,000

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Organic Insecticides & Fungicides	$ 72,749	$ 82,500	$ 72,500	-$10,000
Inorganic Insecticides & Fungicides	39,400	45,900	45,900	-
	112,149	128,400	118,400	-10,000(1)

(1) Apparent decrease for 1933, $10,000; but no decrease in estimated expenditures, since savings totaling $11,350 are being undertaken under this item during 1932, as a part of the general program for reduction of expenditures. These savings will be effected through operating economies and postponement of part of the organic insecticides work.

WORK UNDER THIS APPROPRIATION

The object of these investigations is to develop better methods for the manufacture of known insecticides, fungicides, and fumigants, and for the preparation of new compounds and materials having insecticidal and fungicidal properties, and a study of the chemical problems relating to the application of these materials. The work includes investigations of insecticidal plants, to isolate the active principles, determine their constitution and develop synthetic products; the preparation of new inorganic insecticides and fungicides, particularly substitutes for such compounds as Paris Green and lead arsenate; development of more effective and less hazardous fumigants; and study of the insecticidal residues on foodstuffs and other products and the problem of their removal.

(f) DUST EXPLOSIONS

Funds Available, 1932:		
1. Agricultural Act	$51,700	
Transfer of farm fires project proposed in 1933 Budget to -		
2. Agricultural Investigations .	-15,200	
Total Appropriation, 1932		$36,500
Budget Estimate, 1933		36,390
Decrease		110

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Dust Explosions	$32,454	$36,500	$36,390	-$110 (1)

(1) Apparent decrease for 1933, $110, but no decrease in estimated expenditures since savings totaling $800 are being undertaken under this item during 1932.

CHANGE IN LANGUAGE

The omission of "farm fires and of" in this item is to enable the transfer of the research work on spontaneous heating and ignition of agricultural products and the work on farm fire prevention to the Agricultural Chemical Investigations appropriation, in order to combine this work with the research carried on under that appropriation on heating and deterioration of farm products. The research work on this project is cooperative between the chemical engineering and food research divisions and is entirely independent of the dust explosion research work of the Bureau, which is carried on by a separate staff. The addition of "and grain elevators" is to more adequately describe the existing work.

The language in regard to cooperation with individuals, associations, or corporations is omitted since the general provision for bureau cooperation has been inserted in the introductory paragraph.

WORK UNDER THIS APPROPRIATION

The activities under this appropriation consist of investigations of dust explosions in industrial plants; determination of causes of explosions and extent of hazard; experimental research on explosion pressures, venting areas, inert gases, and relative flamability of representative dusts; development of preventive measures; and the practical application of the results of the research in cooperation with the industries affected and with interested organizations.

(g) NAVAL STORES INVESTIGATIONS

Funds Available, 1932:	
Agricultural Act	$72,306
Budget Estimate, 1933	69,806
Decrease	2,500

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Naval Stores Investigations	$29,885	$32,306	$32,306	-
Naval Stores Station, Lake City, Florida.	-	40,000	37,500	-$2,500
	$29,885	72,306	69,806	- 2,500(1)

(1) Apparent decrease for 1933, $2,500; but no decrease in estimated expenditures since savings totaling $3,000 are being undertaken under this item during 1932 as a part of the general program for reduction of expenditures.

CHANGE IN LANGUAGE

The clauses on cooperation and the employment of persons and means are dropped from this item since the proposed wording in the introductory paragraph adequately covers these matters. The original estimate for the construction of a naval stores research laboratory was $55,000. $40,000 was made available, which is insufficient as the program now develops and authority to expend an additional $10,000 for "continuing" the establishment of this laboratory is necessary. The balance of the appropriation is required to operate the laboratory during 1933.

The wording, "on land owned by the United States or to be donated to the United States for that purpose" should be deleted since the naval stores research laboratory has already been established.

WORK UNDER THIS APPROPRIATION

The purposes of the work under this appropriation are to improve the practices, processes and equipment in the production of turpentine, rosin, and similar products, and to promote utilization of naval stores by developing new and improved commercial products. Research is conducted on the components and properties of turpentines and rosin; studies are made of processes and equipments, and practical demonstrations are given of improved methods of turpentine distillation, still setting, rosin straining, and handling of products.

Researches on naval stores are conducted by both the Bureau of Chemistry & Soils and Forest Service. The Bureau of Chemistry & Soils conducts research on distillation, refinement, and uses of commercial products--that is, after the gum is taken from the tree. The Forest Service covers the forest or woods phase of naval stores work up to the time the gum is taken from the tree.

(h) FERTILIZER INVESTIGATIONS

Funds Available, 1932:		
1. Agricultural Act	$378,400	
Transfer proposed in 1933 Budget to -		
2. General Administration	- 7,565	
Total Appropriation, 1932		$370,835
Budget Estimate, 1933		360,835
Decrease		10,000

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Mechanizm of Catalysis .	$ 34,200	$ 34,970	$ 34,970	-
Transformation of Nitrogen Compounds	34,400	35,385	35,385	-
Mechanical Engineering.	46,410	47,265	47,265	-
Chemical Engineering. .	19,350	19,940	19,940	-
Biochemical & Organic Investigations	27,360	28,330	28,330	-
Physics Investigations.	31,563	37,440	36,160	-$ 1,280
Gas Constants & Chemical Analysis	24,530	25,460	25,460	-
Phosphate Investigations	17,200	37,600	31,275	- 6,325
Potash Investigations .	36,160	37,275	37,275	-
Concentrated Fertilizers	60,180	67,170	64,775	- 2,395
	331,353	370,835	360,835	- 10,000 (1)

(1) Apparent decrease $10,000, but no decrease in estimated expenditures since savings totaling $16,100 are being undertaken under this item during 1932 as a part of the general economy program. The 1932 savings of $16,100 will be accomplished through operating economies and postponement of work for which increases were allowed. A decrease in appropriation of $10,000 is submitted, since savings equal to those in the current year will not be feasible in 1933 under this item.

CHANGE IN ARRANGEMENT

It is recommended that this subappropriation be transferred and made the eighth paragraph insted of the eleventh as at present, in other words follow Naval Stores Investigations. The proposed change in arrangement will be in harmony with and in the interest of the Bureau organization. Furthermore, when budget and Congressional hearings are held, the present order makes necessary breaking into the testimony of the soils unit or passing over the Fertilizer Investigations item.

WORK UNDER THIS APPROPRIATION

Activities under this appropriation are concentrated largely on the development of new processes for the production of nitrogen, phosphate, and potash fertilizers; the study of the practicability of using either new sources of raw products in their production, or of utilizing by-products from other industries; and the determination of the chemical and physical properties of the final products, particularly with regard to their suitability in various fertilizer mixtures. The research program is being developed with the idea that much of the information gained will be of a fundamental nature and have a far-reaching effect, as well as meeting conditions arising in present practices in the industry and on the farm.

(i) SOIL CHEMISTRY AND PHYSICS (Combined for 1933)

Funds Available, 1932:		
Agricultural Act:		
Soil Chemical Investigations .	$42,760	
Soil Physical Investigations .	18,660	
Total Appropriation, 1932		$61,420
Budget Estimate, 1933		61,390
Decrease		30

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Soil Chemistry	$39,082	$42,760	$42,730	- $30
Soil Physics	17,722	18,660	18,660	-
	56,804	61,420	61,390	- 30 (1)

(1) Apparent decrease for 1933, $30 but no decrease in estimated expenditures since savings totaling $550 are being undertaken under this item during 1932.

CHANGE IN LANGUAGE

The changes in this paragraph are for the purpose of combining the present separate appropriation items for soil chemical and soil physical investigations. The relation between these two lines of research is so close that it is difficult to establish any definite point at which one begins and the other ends. The inclusion of both items under one appropriation is in harmony with the bureau organization, as the soil chemistry and soil physics investigations constitute the work of one division.

WORK UNDER THIS APPROPRIATION

The work under this appropriation consists of the chemical an physical analyses of the soils for this bureau and for other government agencies and research on problems relating to the soil. Chemical research

is carried on to provide fundamental information on the potential productiveness of the soils and on the agricultural treatments that will give maximum results. The physical research includes investigations on the effects of soil texture, moisture, temperature and atmosphere on the physical characteristics of soils for the purpose of increasing soil productivity and developing improved methods of soil management.

(j) SOIL SURVEY

Funds Available, 1932:		
1. Agricultural Act	$328,705	
Transfer proposed in 1933 Budget to -		
2. General Administration . . .	- 7,000	
Total Appropriation, 1932		$321,705
Budget Estimate, 1933		311,705
Decrease		10,000

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Detailed and Reconnoissance Surveys	$227,919	$247,425	$237,425	-$10,000
Inspection and Correlation	35,480	35,480	35,480	-
Map Drafting	38,800	38,800	38,800	-
	302,199	321,705	311,705	- 10,000(1)

(1) Apparent decrease $10,000, but no decrease in estimated expenditures since savings totaling $15,100 are being undertaken under this item in 1932 as a part of the general program for reduction of expenditures. The 1932 savings will be accomplished by postponing certain soil surveys for which increases were allowed and through operating economies. Reduction of $10,000 is submitted for 1933, as against estimated savings of $15,100 for 1932, since it is not feasible to anticipate the same savings for 1933 in view of the cooperative agreements which are in effect covering the soil survey work in various States providing for equal expenditures for field work by the Federal Government and the States.

CHANGE IN LANGUAGE

The insertion of "and their origin, for survey of the extent of classes and types, ** and surveys" is to clarify the language and make it more definite and informative as it relates to the work included under this item. The language in regard to cooperation with other agencies is omitted since a general provision for bureau cooperation is submitted in the introductory paragraph.

WORK UNDER THIS APPROPRIATION

The object of the Soil Survey is to map and classify the soils of the United States and make this information available to those interested in agriculture. The ultimate purpose is to provide a soil map of the continental United States which will furnish a foundation of facts upon

which to develop a rational permanent agriculture. The work comprises research of the field characteristics of soils, definition of soil types, development of a system of classification, determination of the areas and boundaries of each type, delineation of boundaries on maps, correlation of soils, and interpretation of relationships. During the past fiscal year detailed soil survey work was carried on in 85 areas scattered over 30 States and in Porto Rico and the Virgin Islands. In four States over 1,400 square miles were surveyed by the reconnoissance method. The work is cooperative with the various States.

(k) SOIL MICROBIOLOGY

Funds Available, 1932:	
Agricultural Act	$43,820
Budget Estimate, 1933	43,755
Decrease	65

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Soil Microbiological Investigations	$42,077	$43,820	$43,755	-$65(1)

(1) Apparent decrease for 1933, $65, but no decrease in estimated expenditures since savings totaling $750 are being undertaken under this item during 1932.

CHANGE IN LANGUAGE

The additions of the following language "of the microorganisms of the soil and their activities," and "other crops, or soil" are for the purpose of making the language conform more closely to the present scope and character of the researches conducted under this appropriation with a view to giving a more adequate statement of the field of work, which has been broadened by the demand for information, and to include researches on inoculants for other crops than legumes and sulphur bacteria and such other products as may be advertised as inoculating the soil with beneficial results.

The insertion of "and the publication of results" indicates the present general practice of the Department, which is to publish a list of the sources from which tested materials may be obtained, but by retention of the existing language, reserves the right to publish also sources of impure, nonviable or misbranded materials if the circumstances require.

WORK UNDER THIS APPROPRIATION

Investigations are made of the legume nodule bacteria, and their relation to nitrogen fixation and soil improvement; inspection of all brands of legume inoculants offered for sale to the farmer; cooperation with farmers and with the extension service by furnishing inoculation material for legumes introduced into new areas; study of the bacteria and fungi of the soil and their relation to the decomposition of crop

residues and green manures plowed under; to oxygen utilization in and carbon dioxide evolution from the soil, to nitrogen fixation, to soil organic matter, to the roots of growing crops, and their influence upon farm practices in crop production.

(1) SOIL FERTILITY

Funds Available, 1932:		
1. Agricultural Act	$227,080	
Transfer proposed in 1933 Budget to -		
2. General Administration . . .	- 7,000	
Total Appropriation, 1932		$220,080
Budget Estimate, 1933		210,080
Decrease		10,000

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Soil Fertility Investigations	$144,298	$152,376	$151,105	-$ 1,271
Cotton Root-Rot	49,000	57,729	49,000	- 8,729
South Carolina Station .	9,634	9,975	9,975	-
	$202,932	$220,080	$210,080	-$10,000 (1)

(1) Apparent decrease $10,000, but no decrease in estimated expenditures since savings totaling $12,400 are being undertaken under this item in 1932 as a part of the general program for reduction of expenditures.

CHANGE IN LANGUAGE

The inclusion of "effects of soil composition, cultural methods, fertilizers, and soil amendments on yield and quality of crops; and the" and "formation and transformation ** organic matter" are for the purpose of making the wording more exact and informative as it relates to the researches carried on under this appropriation. The wording marked for omission is either inapplicable or not sufficiently comprehensive, and the inserted language is for amplification to give a more inclusive statement of the present field of work.

WORK UNDER THIS APPROPRIATION

The duties and functions of the Division of Soil Fertility Investigations comprise a fundamental study of the biochemical relationships existing among soils, fertilizers, and crops. The work is carried on through field, laboratory, and greenhouse studies. The field work is conducted at about 50 localities in the United States; the laboratory and greenhouse studies are carried on at the Arlington Experimental Farm.

Fertilizer and soil fertility investigations are conducted on cotton, corn, sugar beets, sugar cane, potatoes, sweet potatoes, citrus fruits, pecans, peaches, and a number of truck and forage crops. The field work is designed to test: (1) the comparative effectiveness of various fertilizer ratios or formulas, as evidenced by crop response and production; (2) the comparative value of different nitrogen, phosphate and potash carriers for fertilizer usage; (3) the effectiveness of synthetic nitrogen materials; (4) the economy and crop-producing value of concentrated fertilizers; and (5) the effect of rare soil elements, such as manganese, copper, etc., on plant growth and crop production.

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Note - Also see Miscellaneous Section for "Work for other Departments", and "Soil Erosion Investigations".

BUREAU OF ENTOMOLOGY

CHANGE IN LANGUAGE

The insertion of the word "corporations" in the introductory paragraph is recommended for the reason that under the present language, there has been some doubt as to the authority to enter into certain types of cooperation with a corporation. The proposed addition would clear up this point.

The insertion of the provision "Provided further, that greenhouses may be erected without reference to any limitation hereunder," is recommended for the reason that under Comptroller's decisions and opinions of legal advisors of the Department a greenhouse has been held to be a building. Greenhouses are an essential part of the equipment necessary in certain kinds of experimental work for which appropriations are made to the Bureau of Entomology. The effect of rulings including greenhouses within the limitations placed on buildings has made it impossible to effectively carry out certain essential work. It is impossible to construct for $1,500 a greenhouse of the type which is required in some of the Bureau's experiments. The insertion of the requested proviso will remove this technical objection and enable the bureau to more effectively conduct authorized investigations, without increasing expenditures.

REORGANIZATION OF WORK

For convenience in administration of its various activities, the bureau is divided into several divisions. To better classify the research work and to bring together activities which involve related control methods, a minor reorganization of some of these divisions has been effected and the estimates contemplate a similar realignment of the sub-appropriations, together with the necessary changes to make the appropriation language conform with the functional organization. This new grouping of activities eliminated the operating Division of Tropical, Subtropical, and Ornamental Plant Insects and distributed its components to other existing divisions. It provided also for the limitation of the Forest Insect Division to forest insect problems, including those relating to raw or crude forest products.

The following changes have resulted from this reorganization:

(1) The Division of Deciduous Fruit Insects became "Insects Affecting Fruit and Shade Trees" and includes, in addition to deciduous fruits, citrus and other subtropical fruits, and by transfer from Forest Insects, all work involving shade and ornamental trees and shrubs, which, both as to insect enemies and control measures, is closely related to orchard operations;

(2) the division of Truck Crop Insects became "Insects Affecting Truck and Garden Crops," to include, in addition to truck crops, insects affecting greenhouse plants, bulbs, roses, and other miscellaneous ornamentals;

(3) the Division of Insects Affecting Stored Products, including household pests, was enlarged by transfer from Forest Insects of the section dealing with termites and certain other insects attacking wood in buildings, furniture and stored finished wood products. To this division also was added the new appropriation available July 1 for the study of control of the Argentine ant--the major importance of which is as a household pest;

(4) the Division of Taxonomy and Interrelations of Insects is now made definitely to include for administrative purposes certain fundamental work hitherto carried under the appropriations for Deciduous Fruit Insects and Truck Crop Insects; (a) the disinfection of plants and plant products, (b) the physiology and toxicology of insects, and (c) the classification of insects.

To permit ready comparison of the amount of funds allotted to a particular activity, project, or item, the tabular statements included in these estimates are arranged to give this information for 1931 and 1932 on the same basis as proposed for the fiscal year 1933. The initial tabulation under each item, however, makes it possible to readily ascertain the amount of each appropriation item included in the 1932 Act.

The following statement gives the amounts appropriated to the various items in the 1932 Act and those requested for 1933:

	Appropriated 1932 Act	Budget 1933
General Administration	$ 94,380	$148,060
Deciduous Fruit Insects	474,950	-------
Subtropical Plant Insects	188,035	-------
Truck Crop Insects	424,185	-------
Forest Insects	243,590	211,290
Cereal and Forage Insects	577,220	534,720
Cotton Insects	304,820	276,820
Insects Affecting Man and Animals	159,500	149,300
Household and Stored Product Insects	136,920	149,920
Taxonomy and Interrelations of Insects	184,720	235,730
Bee Culture	75,420	71,420
Fruit and Shade Tree Insects	-------	507,445*
Truck and Garden Crop Insects	-------	426,690
Total	2,863,740	2,711,395*

*Includes reappropriation of $55,000 of unexpended balance of appropriation provided by 1931 Agricultural Appropriation Act for Mediterranean Fruit Fly, to be expended for fruit fly research.

(a) GENERAL ADMINISTRATIVE EXPENSES

Appropriation 1932.	$ 94,380
Budget 1933.	148,060
Increase	53,680

This is an apparent increase, since funds totaling $53,680 are transferred from the following appropriations which have been reduced accordingly:

a.	Fruit and Shade Tree Insects. . .	$ 13,700
b.	Truck and Garden Crop Insects . .	8,000
c.	Forest Insects.	4,400
d.	Cereal and Forage Insects	10,000
e.	Cotton Insects.	6,000
f.	Insects Affecting Man and Animals.	2,600
g.	Household and Sored Product Insects	1,900
h.	Taxonomy and Interrelations of Insects.	5,580
i.	Bee Culture and Apiary Management.	1,500
	Total	53,680

Because of the increases in appropriations and work the amount appropriated under the item "General Administrative Expenses" has for many years been inadequate to permit effective administration of the general work of the bureau -- i.e. necessary work applicable and beneficial to all divisions. To partially meet this situation and provide assistance required to handle purchases, accounts, audits, appointments of employees, etc., it has been necessary to charge a portion of the expenses for such work to the various other appropriation items. In order to simplify accounting and give an accurate picture of the amount spent for general administrative purposes the estimate contemplates the transfer to the item "General Administrative Expenses" those amounts from the several appropriation items which have heretofore been used for general administrative expenses and reduce the several items from which the transfers are to be made by a corresponding amount. These transfers do not involve any increase in personnel or in total expenditures. The schedules of expenditures accompanying the estimates indicate the amounts which it is proposed to transfer from the various items and the amount of these items which have been allotted to augument the general administrative fund during the fiscal years 1931 and 1932.

This rearrangement provides an administrative fund large enough to pay the salaries of the employees now engaged in such work; provides for necessary travel of the responsible administrative officers and funds for the purchase of equipment and supplies needed for the central administrative offices or for the general benefit of the bureau as a whole.

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
General Administration..	$144,503	$148,060	$148,060	---------

WORK UNDER THIS APPROPRIATION

This appropriation provides for the general personnel and business operations of the bureau, including accounts, audits, supplies, property, editorial, and library.

(b) FRUIT AND SHADE TREE INSECTS

Funds Available, 1932:			
1. Agricultural Act (Deciduous Fruit Insects).....	$474,950		
2. Transfer from following appropriations to conform with realignment of work, proposed in Budget, 1933:			
a. "Subtropical Plant Insects"....	126,430		
b. "Forest Insects".....	10,000	$611,380	
3. Less transfer to appropriation "Taxonomy and Interrelations of Insects" to conform with realignment of work proposed in Budget, 1933.....	48,490		
4. Less transfer to appropriation "General Administration", proposed in Budget, 1933.....	13,700		
5. Less amount available and expended in 1931.....	4,000	66,190	
Total Appropriation, 1932.....			$545,190
Budget Estimate, 1933.....			507,445
Decrease.....			37,745*

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Apple Insect.....	$61,853	$ 63,955	$ 45,155	- $18,800 (1)
Peach Insects.....	104,290	114,760	59,415	- 55,345 (2)
Grape Insects.....	5,561	6,095	6,095	-----
Nut Insects.....	37,808	38,335	38,335	-----
Blueberry Maggot.....	6,589	7,155	7,155	-----
Subtropical Fruit Insects:				
Black Fly Parasites.....	5,588	6,000	6,000	-----
Resistant Scale Insects.....	24,051	25,000	25,000	-----
Parlatoria Date Scale...	3,700	5,000	4,700	- 300
Citrus Insects in Gulf Region.....	14,122	16,461	14,779	- 1,682
Citrus Insects in California.....	8,617	8,135	6,035	- 2,100
Total.....	56,078	60,596	56,514	- 4,082 (3)
Fruit Flies:				
In Hawaii.....	8,025	8,025	62,825	+ 54,800
In Canal Zone.....	3,740	5,840	5,840	-----
In Mexico.....	31,440	34,785	31,867	- 2,918
Total.....	43,205	48,650	100,532	+ 51,882 (4)
Shade Tree & Hardy Shrubs:				
Camphor Scale.....	13,816	13,884	11,984	- 1,900
Shade Tree Insects.....	9,317	10,000	10,000	-----
Total.....	23,133	23,884	21,984	- 1,900 (5)
Japanese & Asiatic Beetles.....	173,964	181,760	172,260	- 9,500 (6)
	512,481	545,190	507,445	- 37,745*

* Apparent decrease, $37,745; actual decrease in anticipated expenditures, $345, as it is contemplated that savings of $37,400 will be effected under this appropriation during 1932 as a part of the general program for reduction of expenditures.

The decrease of $37,745 in appropriations is explained as follows:

(1) "Apple Insects":

Savings due to operating economies (1932 and continued in 1933).....$ 8,800
Additional reduction, 1933, account discontinuance of the codling moth work in eastern Kansas..... 10,000
$18,800

(2) "Peach Insects":

Savings due to operating economies (1932 and continued in 1933).....	$ 10,000
Additional reduction, 1933, on account of discontinuance of the large scale bait-trap work on the Oriental Fruit Moth in Indiana and Georgia.....	45,345
	55,345

(3) "Subtropical Fruit Insects":

Savings due to operating economies (1932 and continued in 1933).....	$ 4,082

(4) "Fruit Flies":

Apparent increase $51,882; no actual increase in appropriation, since an amount of $55,000 of the unexpended balance of the appropriation for the Mediterranean Fruit Fly contained in the Agricultural Act for the fiscal year 1931 is requested to be made available for research work in the Hawaiian Islands in 1933. Funds were provided for this work in 1932 by reappropriation in the Second Deficiency Act to the Plant Quarantine and Control Administration. $55,000 of the amount available was allotted to the Bureau of Entomology for investigations on the Mediterranean fruit fly in Hawaii.....	+ $55,000
Savings due to operating economies (1932 and continued in 1933).....	- 3,118
	+ 51,882

(5) "Shade Tree & Hardy Shrubs":

Savings due to operating economies in work on camphor scale (1932 and continued in 1933)...	$1,900

(6) "Japanese & Asiatic Beetles":

Savings due to operating economies (1932 and continued in 1933).....	$ 9,500

CHANGE IN LANGUAGE

The insertion of the following language in lieu of the previous language under this item is recommended in order to provide authority for certain activities which have heretofore been carried under the appropriation items "Subtropical Plant Insects" and "Forest Insects" and which are transferred to this item to agree with the proposed reorganization of work. It also provided for the reappropriation of $55,000 from an unexpended balance for the continuance of research in Hawaii on the Mediterranean fruit fly:

> "Fruit and shade tree insects: For insects affecting fruits, grapes, nuts, shade trees and hardy shrubs, and including research on the Japanese and Asiatic beetles, the Parlatoria date scale, and fruit flies,$452,445: Provided, That $55,000 of the unexpended balance of the appropriation for the Mediterranean Fruit Fly contained in the Agricultural Appropriation Act for fiscal year 1931 shall remain available until June 30, 1933, for use in research work in the Hawaiian Islands (submitted)"

WORK UNDER THIS APPROPRIATION

The work done under this appropriation item deals with investigations of insects which affect woody horticultural plants including fruits, nuts, shade and ornamental trees and shrubs. It also includes work on insects injurious to grapes and those small fruits which have their seeds internally such as blueberries and cranberries. It provides for investigations on the Japanese and Asiatic beetles. These activities involve studies of the habits and development of insects injurious to these crops, and investigations to determine effective means of control. Investigations, at laboratories outside of the Continental United States, on fruit flies -- such as the Mediterranean fruit fly and the Mexican fruit worm -- are carried on under this item. Field laboratories at which investigations are carried on and where growers may obtain information as to control of pests are maintained in the principal fruit growing regions of the country. Temporary laboratories are also maintained in certain foreign countries as headquarters for the collection and preparation for shipment into the United States of parasites or other natural enemies which aid in the control of various pests.

(c) SUBTROPICAL PLANT INSECTS

(Omitted 1933, as explained below)

Funds Available, 1932:			
1. Agricultural Act.....		$188,035	
Less transfers to following appropriations proposed in Budget, 1933, in accordance with realignment of appropriations previously explained:			
"Fruit & Shade Tree Insects".....	$126,430		
"Truck & Garden Crop Insects".....	46,605		
"Household & Stored Product Insects"...	15,000	$188,035	
Total Appropriation, 1932.....			$-------
Budget Estimate, 1933.....			-------

(d) TRUCK AND GARDEN CROP INSECTS

Funds Available, 1932:			
1. Agricultural Act (Truck Crop Insects).		$424,185	
2. Transfer from appropriation "Subtropical Plant Insects", to conform with realignment of work proposed in Budget, 1933.....	46,605	$470,790	
3. Less transfer to appropriation "Taxonomy and Interrelations of Insects", to conform with realignment of work proposed in Budget, 1933.....	11,100		
4. Less transfers to appropriation "General Administration" proposed in Budget, 1933.....	8,000	19,100	
Total Appropriation, 1932.....			$451,690
Budget Estimate, 1933.....			426,690
Decrease.....			25,000(1)

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Truck Crop Insects:				
European Earwig.....	$10,629	$11,410	$11,410	--------
Vegetable Weevil.....	9,200	9,440	9,440	--------
Turnip Aphid.....	-----	9,526	9,526	--------
Pepper Weevil.....	4,800	5,000	5,000	--------
Celery Insects.....	15,400	16,000	16,000	--------
Sweet Potato Weevil.....	14,800	15,000	14,500	- 500
Sweet Potato Wireworm....	4,500	5,000	5,000	--------
Wireworms in Pacific Northwest.....	45,101	46,045	41,245	-4,800
Wireworms in California..	12,199	12,830	11,630	-1,200
Wireworms in South Carolina.....	7,500	7,500	7,500	--------
Bean Insects.....	39,647	50,125	47,125	-3,000
Lima Bean Pod Borer.....	7,500	7,500	7,500	--------
Pea Insects.....	8,750	8,960	8,960	--------
Other Truck Crop Insects.	31,941	34,727	28,727	-6,000
Total.....	211,967	239,063	223,563	-15,500
Berry Insects.....	10,440	21,410	20,410	- 1,000
Sugar Beet Insects.....	110,151	110,485	103,485	- 7,000
Tobacco Insects.....	27,479	27,927	27,427	- 500
Insects Affecting Green-Houses:				
Mushroom Insects.....	5,612	6,200	6,200	-----
Greenhouse Insects.....	22,245	23,565	23,065	- 500
Bulb Insects.....	22,467	23,040	22,540	- 500
Total.....	50,324	52,805	51,805	- 1,000
	410,361	451,690	426,690	-25,000 (1)

(1) Apparent decrease, $25,000; no actual decrease is involved as it is contemplated that savings of this amount will be effected through operating economies during 1932 as a part of the general program for reduction of expenditures, and these reductions will be continued in 1933 and the appropriation reduced accordingly.

CHANGE IN LANGUAGE

The insertion of the following, in lieu of previous language, is recommended to provide under this item authorization for work heretofore performed under authority included under the item "Truck Crop Insects" and also for certain work heretofore carried on under the item "Subtropical Plant Insects". The latter appropriation item is -- as explained elsewhere -- being discontinued in accordance with the reorganization:

"Truck and garden crop insects: For insects affecting truck and garden crops, including tobacco, sugar beets, and ornamental plants, $426,690(submitted)."

WORK UNDER THIS APPROPRIATION

The work done under this supappropriation has to deal with the study of insects and the development of means of control of the forms injurious to truck and garden crops including vegetables, flowers, bulbous plants, potted ornamentals, and plants grown under glass and includes such related crops as strawberries, raspberries, blackberries, sugar beets, and tobacco. It also provides for investigations on the European earwig, pests of mushrooms, soil insects such as wireworms and white grubs attacking vegetables. Field laboratories are maintained at various points throughout the United States, particularly in the more important trucking regions.

(e) FOREST INSECTS

Funds Available, 1932:			
1. Agricultural Act		$243,590	
2. Less transfers to following appropriations to conform with realignment of work proposed in Budget, 1933:			
a. "Fruit and Shade Tree Insects"	$10,000		
b. "Household & Stored Product Insects"	4,900		
3. Less transfer to "General Administration", proposed in Budget, 1933	4,400	19,300	
Total Appropriation, 1932			$224,290
Budget Estimate, 1933			211,290
Decrease			13,000

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Forest Insects:				
Cooperative control	$49,160	$50,000	$47,000	-$3,000
Tree-killing insects	44,600	56,120	53,120	- 3,000
Locust borer	-----	8,460	8,460	-----
Forest products	7,209	7,380	7,380	-----
Total	100,969	121,960	115,960	- 6,000
Gipsy and other moths	96,496	102,330	95,330	- 7,000
Grand total	197,465	224,290	211,290	-13,000 (1)

(1) Apparent decrease, $13,000; no actual decrease in anticipated expenditures as it is contemplated that savings of this amount will be effected through operating economies during 1932 as part of the general program for reduction of expenditures, and these reductions will be continued in 1933, and the appropriation reduced accordingly.

CHANGE IN LANGUAGE

The elimination of the words "for insects affecting ornamental trees and shrubs" is recommended because of the proposed transfer of the work on shade trees and shrubs to the item "Fruit and Shade Tree Insects".

WORK UNDER THIS APPROPRIATION

The work under this appropriation includes the many activities dealing with the investigation and control of insects attacking forest trees and crude forest products and concerns both research work on the insects and the determination of methods of control-- involving plans for campaigns carried on in cooperation with Federal and State officials and private owners -- against serious outbreaks of insect pests over large forest areas. It provides also for research on the gipsy and brown-tail moths, the development of control methods both artificial and natural -- the latter involving the importation of parasitic and predacious enemies.

(f) CEREAL AND FORAGE INSECTS

Funds Available, 1932:		
1. Agricultural Act.....	$577,220	
2. Less transfer to appropriation "General Administrative Expenses" proposed in Budget, 1933.....	10,000	
Total Appropriation, 1932		$567,220
Budget Estimate, 1933		534,720
Decrease.....		32,500

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Cereal & Forage Insects:				
Hessian Fly.....	$34,258	$35,410	$33,410	- $2,000
Chinch Bug.....	17,750	17,770	17,570	- 200
Grasshoppers.....	28,924	29,180	29,180	-----
Mormon Cricket.....	7,950	8,000	-----	- 8,000
Cereal Insects.....	35,032	41,570	40,020	- 1,550
Alfalfa Weevil.....	29,647	39,125	37,125	- 2,000
Insects & Diseases.....	13,000	13,000	13,000	-----
Forage Insects.....	43,537	44,205	36,805	- 7,400
Alfalfa Chalcis.....	12,000	13,000	13,000	-----
Alfalfa Aphid.....	------	10,000	10,000	-----
Range Caterpillar.....	10,000	10,000	10,000	-----
Total.....	232,098	261,260	240,110	- 21,150
European Corn Borer.....	251,644	262,400	254,300	- 8,100
Sugar Cane & Rice Insects.	40,595	43,560	40,310	- 3,250
Grand Total.....	524,337	567,220	534,720	- 32,500 (1)

(1) Apparent decrease, $32,500; actual decrease in anticipated expenditures, $8,000, as it is contemplated that savings of $24,500 will be effected under this appropriation during 1932 as a part of the general program for reduction of expenditures. This $24,500 is dropped from the estimates for 1933. The additional reduction of $8,000 contemplates discontinuance of the Mormon cricket control work in northwestern Colorado which has progressed to a point to permit such action.

CHANGE IN LANGUAGE

The elimination of the words "of which amount not to exceed $1,000 may be used for the rent of land in the Southwest for the investigation of the alfalfa seed chalcid, if the Secretary of Agriculture is able to lease said land for a period of not to exceed 10 years, at a rate not to exceed $1,000 per annum" is recommended as the preamble of the bureau contains general authority to rent land outside the District of Columbia.

WORK UNDER THIS APPROPRIATION

This subappropriation provides for the investigation of insects affecting cereal and forage crops including sugar cane and rice. The object of these studies is to develop control measures by which the injury caused by these insects may be reduced. The service thus provided is distributed through all of the important corn and grain producing States of the Union. While the value of these crops amounts to several billion dollars in the aggregate, the acreage value is usually relatively small, and consequently the amount which can be expended in combating insect pests likewide is limited. Such control measures usually consist of appropriate adaptations of regular farm practices, and the continuation of the basic investigations over a period of several years is of primary importance. Among the more important subjects of research are the European corn borer, Hessian fly, white grubs, wireworms, joint worms, corn earworm, cutworms, chinch bug, leafhoppers, and grasshoppers and crickets, alfalfa weevil, sugar cane borers, and many others.

Important activities under this appropriation for which funds were recently allotted include the investigation of (a) the alfalfa leafhopper, (b) the range caterpillar, (c) the alfalfa weevil, (d) parasites of the European corn borer, (e) the sugar cane moth borer as a pest of corn, and (f) parasites of the sugar cane moth borer.

(g) COTTON INSECTS

Funds Available, 1932:		
1. Agricultural Act.....	$304,820	
2. Less transfer to appropriation "General Administrative Expenses" proposed in Budget, 1933..	6,000	
Total Appropriation, 1932.....		$298,820
Budget Estimate, 1933.....		276,820
Decrease.....		22,000

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Cotton Boll Weevil.....	$162,440	$138,480	$116,480	- $22,000
Misc. Cotton Insects.....	57,638	59,090	59,090	-----
Thurberia Weevil.....	28,220	35,385	35,385	-----
Pink Bollworm.....	33,525	65,865	65,865	-----
	281,823	298,820	276,820	- 22,000 (1)

(1) Apparent decrease, $22,000; no actual decrease in anticipated expenditures as it is contemplated that savings of this amount will be effected through the discontinuation of airplane dusting experiments during 1932, and the appropriation is reduced accordingly.

WORK UNDER THIS APPROPRIATION

The funds appropriated under this heading are used for the investigation of insects injurious to the cotton crop with a view to the development of practicable control measures or where such appears to be feasible the development of methods which may be utilized in eradication campaigns. The principal insects dealt with under this subappropriation are the cotton boll weevil, the pink bollworm, the Arizona weevil, the bollworm, leafworm and flea hopper.

Specific lines of work which have been of particular interest recently include (a) investigation of methods for the control of flea-hopper, cotton-leaf perforator, (b) collection of pink bollworm parasites and (c) investigation of the control of the pink bollworm.

(h) INSECTS AFFECTING MAN AND ANIMALS

Funds Available, 1932:		
1. Agricultural Act.....	$159,500	
2. Less transfer to appropriation "General Administrative Expenses" proposed in Budget, 1933.....	2,600	
Total Appropriation, 1932.....		$156,900
Budget Estimate, 1933.....		149,300
Decrease.....		7,600

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Insects Affecting Man:				
Eye Gnat.....	$ 9,500	$10,000	$10,000	------
Mosquito Investigations...	23,520	23,920	22,920	- $1,000
Osteomyelitis.....	-----	10,000	10,000	------
Sand Fly.....	15,692	16,100	16,100	------
Total.....	48,712	60,020	59,020	- 1,000
Insects Affecting Cattle....	48,194	57,120	50,520	- 6,600
Poultry & Birds.....	673	1,000	1,000	-----
Sheep & Goats.....	21,158	32,560	32,560	-----
Miscellaneous Animals.....	4,601	6,200	6,200	-----
Total.....	123,338	156,900	149,300	- 7,600 (1)

(1) Apparent decrease, $7,600; no actual decrease in anticipated expenditures as it is contemplated that savings of this amount will be effected through operating economies during 1932 as part of the general program for reduction of expenditures, and these reductions will be continued in 1933 and the appropriation reduced accordingly.

WORK UNDER THIS APPROPRIATION

The investigations now being conducted by this division relate to insects which affect man or animals either by direct attack or by carrying disease. Among the insects which affect man, especial attention is given to malaria mosquitoes, various pest mosquitoes, the house fly,

eye gnat and sandflies. Among live stock pests being investigated are the cattle grub, screw worm, various lice, ticks, and mites. Other investigations relating to methods of controlling poultry parasites, such as mites, ticks and lice are under way.

Important activities under this appropriation for which funds were recently allotted include, (a) mosquito investigations in the northwest, (b) investigations of insects affecting the reindeer, (c) sand fly investigations, and (d) investigations of ticks.

(i) HOUSEHOLD AND STORED PRODUCT INSECTS

Funds Available, 1932:			
1. Agricultural Act		$136,920	
2. Transfer of the following to this appropriation to conform with re-alignment of work proposed in Budget, 1933:			
a. "Forest Insects"	4,900		
b. "Subtropical Plant Insects"	15,000	$156,820	
3. Less transfer to appropriation "General Administrative Expenses" proposed in Budget, 1933		1,900	
Total Appropriation, 1932			$154,920
Budget Estimate, 1933			149,920
Decrease			5,000

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Stored Product Insects:				
Bean Weevil	$ 9,243	$10,472	$10,072	- $ 400
Pea Weevil	4,605	15,000	15,000	-----
Stored Grain	35,650	36,273	34,573	- 1,700
Dried Fruits	14,182	15,633	14,633	- 1,000
Stored Tobacco	11,265	35,715	35,215	- 500
Confections	3,834	5,000	5,000	-----
Wood Products	4,900	4,900	4,900	-----
Total	83,679	122,993	119,393	- 3,600
Household Insects	15,380	16,927	16,127	- 800
Argentine Ant	------	15,000	14,400	- 600
Total	99,059	154,920	149,920	- 5,000 (1)

(1) Apparent decrease, $5,000; no actual decrease in anticipated expenditures as it is contemplated that savings of this amount will be effected during 1932 as a part of the general program for reduction of expenditures, and these reductions will be continued in 1933 and the appropriation reduced accordingly.

CHANGE IN LANGUAGE

The dropping of the immediately available provision is recommended because it is estimated that no portion of the 1933 appropriation will be needed before the beginning of that fiscal year.

The insertion of the descriptive words "household insects and" is recommended as informatory language and to provide specific authority to carry on work on household insects. The addition of these words indicates clearly the proper allocation of the work on insects of this kind and specifically authorizes work which has been conducted for many years in this field.

The addition of the clause "including $4,900 for insects affecting forest products under section 4 of the Act approved May 22, 1928 (U. S. C., Supp. IV, title 16, sec. 581c)," is recommended in order to indicate that the work on wood products authorized under the McNary-McSweeney Act and heretofore carried on under the item "Forest Insects" is being transferred and will hereafter be performed under this item.

WORK UNDER THIS APPROPRIATION

The work conducted under this appropriation deals with the investigations on insects injurious to stored products including agricultural commodities and manufactured articles. It also provides for investigations on, and the development of means for control of, insects, as household pests -- including the Argentine ant. The activities relate to, (1) infestations affecting such stored grain as wheat, corn, small grains, and cereal products, including all forms of package cereals, flour, etc., (2) insects attacking dried fruits, (3) weevils affecting beans and peas, (4) insects affecting fabrics, furniture, etc., (5) insects attacking stored wood products and finished wood products such as lumber, furniture, etc., in use, (6) insects of the household, including bedbugs and cockroaches, (7) the development of general methods for controlling stored product insects, including the utilization of heat, cold and fumigants, and (8) surveys to determine occurrence and density of population of the Argentine ant and the investigation and improvement of control methods.

(j) TAXONOMY AND INTERRELATIONS OF INSECTS

Funds Available, 1932:			
1. Agricultural Act.....	$184,720		
2. Plus transfer from the following appropriations to conform with the realignment of work proposed in Budget, 1933:			
a. "Fruit and Shade Tree Insects".....	48,490		
b. "Truck and Garden Crop Insects".....	11,100	$244,310	
3. Less transfer to appropriation "General Administrative Expenses" proposed in Budget, 1933.....		5,580	
Total Appropriation, 1932.....			$238,730
Budget Estimate, 1933.....			235,730
Decrease			3,000

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Taxonomic Investigations:				
Beetles.....	$ 25,857	$ 26,190	$ 26,190	------
Moths.....	68,194	24,340	24,340	------
Flies.....	10,140	10,820	10,820	------
Hymenoptera.....	27,813	28,517	28,517	------
Grasshoppers.....	5,372	5,540	5,540	------
True Bugs.....	3,305	4,000	4,000	------
Scale Insects.....	9,758	14,160	14,160	------
Leafhoppers.....	4,600	4,600	4,600	------
Aphids.....	3,400	3,400	3,400	------
Ectoparasites and Mites...	5,203	5,270	5,270	------
Total.....	163,642	126,837	126,837	------
Insect Pest Survey.....	14,274	14,403	14,403	------
Public Relations	12,658	18,540	18,540	------
Bioclimatic Studies of Insects.....	8,067	3,080	3,080	------
Morphological Investigations	9,460	9,800	9,800	------
Exchange of Useful Insects..	9,181	9,480	9,480	------
Physiology and Toxicology...	35,077	40,800	37,800	- $3,000
Disinfection of Plant Products.....	15,790	15,790	15,790	------
Grand Total.....	268,149	238,730	235,730	- 3,000(1)

(1) Apparent decrease, $3,000; no actual decrease in anticipated expenditures as it is contemplated that savings of this amount will be effected through operating economies during 1932 as part of the general program for reduction of expenditures, and these reductions will be continued in 1933 and the appropriation reduced accordingly.

WORK UNDER THIS APPROPRIATION

The funds supplied under this appropriation item provide for investigations on a number of basic subjects necessary for the conduct of much of the bureau's economic work. They include (1) the identification, classification, and description of insects in both adult and immature stages, -- involving the naming of large numbers of specimens for other offices of the Federal Government, State experiment stations, institutions, etc.; (2) the collecting, recording, analyzing, and maintaining records on insect abundance and damage, the furnishing such information as well as a statement of current insect conditions to entomologists throughout the country; (3) the preparation -- in cooperation with the Office of Cooperative Extension Work -- of educational material on entomology, planning and supervising the erection of entomological exhibits and furnishing to State officials the latest information on methods of control of insect pests; (4) investigations of the broader phases of the relation between insects and the environmental conditions influencing their development and abundance; (5) fundamental investigations on the anatomy and structure of insects; (6) cooperative coordination of work involved in the distribution of insects beneficial in the control of injurious species; (7) fundamental investigations on the physiology and toxicology of insects to secure basic information as to various chemicals or other materials used as insecticides, attractants, or baits for the purpose of killing injurious insects; (8) studies on the methods of disinfecting plants and plant products in order to meet quarantine requirements.

(k) BEE CULTURE AND APIARY MANAGEMENT

Funds Available, 1932:		
1. Agricultural Act.....	$ 75,420	
2. Less transfer to appropriation "General Administrative Expenses" proposed in Budget, 1933	1,500	
Total Appropriation, 1932.....		$73,920
Budget Estimate, 1933.....		71,420
Decrease.....		2,500

PROJECT STATEMENT

Project	Expended 1931	Estimated 1932	Estimated 1933	Increase or decrease
Biological Studies:				
Behavior of Bees.....	$13,968	$14,280	$14,280	$ ------
Diseases of Bees.....	6,245	6,300	6,300	------
Physiology of Bees.....	4,908	5,050	4,250	- 800
Total.....	25,121	25,630	24,830	- 800
Technological Studies.....	12,014	13,910	12,210	- 1,700
Beekeeping in Intermountain Region.....	9,929	10,440	10,440	-----
Beekeeping in Southern States	10,208	10,440	10,440	-----
Beekeeping in Pacific States.	13,134	13,500	13,500	-----
Grand Total.....	70,406	73,920	71,420	- 2,500 (1)

(1) Apparent decrease, $2,500; no actual decrease in anticipated expenditures as it is contemplated that savings of this amount will be effected through operating economies during 1932 as part of the general program for reduction of expenditures, and these reductions will be continued in 1933 and the appropriation reduced accordingly.

WORK UNDER THIS APPROPRIATION

The work under this appropriation is concerned with investigations on the habits and management of bees to make the production of honey and wax more profitable, and to facilitate the pollination of fruit and forage crops by the use of honey bees. Much valuable work is done each year and this has greatly aided in stabilizing the beekeeping industry.

Investigations of problems of bee culture particular to the southern states, intermountain region, and Pacific coast states are given special attention and field laboratories are maintained in each of these areas.

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